

MATHEMATICS A

Paper 2FR

2015 — Winter 2019

Chapter 1	NUMBER	Page 1
Chapter 2	ALGEBRA	Page 82
Chapter 3	FUNCTIONS & GRAPHS	Page 108
Chapter 4	MENSURATION	Page 117
Chapter 5	GEOMETRY	Page 133
Chapter 6	TRIGONOMETRY	Page 168
Chapter 7	SETS	Page 174
Chapter 8	STATISTICS	Page 179
Chapter 9	PROBABILITY	Page 202
Chapter 10	VECTORS	-----
Chapter 11	MATRICES	-----
Chapter 12	TRANSFORMATION	Page 216
Chapter 13	DIFFERENTIATION & KINEMATICS	-----
	ANSWERS	Page 221



1 - (4MA0-S 2015-Paper 2FR-Q1) - NUMBER

(a) Write down the value of the 3 in the number 4.23

.....
(1)

(b) Write 0.57 as a percentage.

..... %
(1)

(c) Here are five decimal numbers.

3.2	3.082	3.01	3.004	3.10
-----	-------	------	-------	------

(i) Write down the smallest of these numbers.

.....
(ii) Write down the largest of these numbers.

.....
(2)

(d) Write 30.845 correct to 1 decimal place.

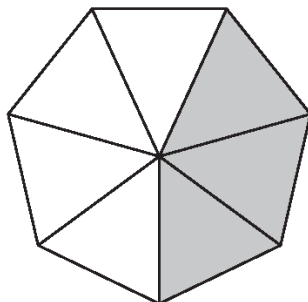
.....
(1)

(Total for Question is 5 marks)



2 - (4MA0-S 2015-Paper 2FR-Q2) - NUMBER

- (a) The shape is divided into equal triangles.
What fraction of this shape is shaded?



.....
(1)

- (b) Work out $\frac{1}{3}$ of 24

.....
(1)

- (c) Write $\frac{4}{5}$ as a decimal.

.....
(1)

- (d) Here are five fractions.

$$\frac{5}{20}$$

$$\frac{9}{36}$$

$$\frac{25}{100}$$

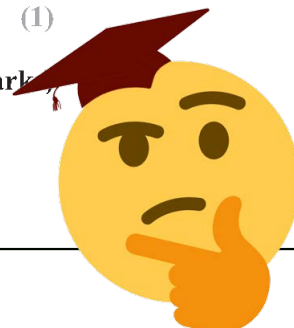
$$\frac{12}{52}$$

$$\frac{17}{68}$$

Find which one of these fractions is **not** equal to $\frac{1}{4}$

.....
(1)

(Total for Question is 4 marks)



3 - (4MA0-S 2015-Paper 2FR-Q6) - *NUMBER*

The circles contain terms in a number sequence.



The 5th term and the 8th term are missing.

(a) (i) Write down the 5th term of the sequence.

.....

(ii) Write down the 8th term of the sequence.

.....

(2)

(b) Write down the rule for working out the terms of this sequence.

.....
(1)

The 13th term of the sequence is 3

(c) Work out the 14th term of the sequence.

.....
(1)

A new sequence is made by adding 5 to each term of the first sequence.

(d) Write down the 13th term of this new sequence.

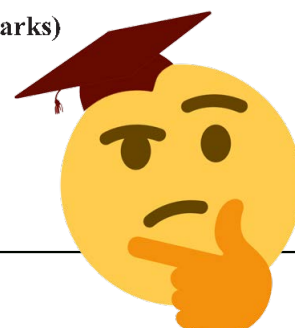
.....
(1)

The sum of the first four terms of the first sequence is 348

(e) Work out the sum of the first four terms of the new sequence.

.....
(1)

(Total for Question is 6 marks)



4 - (4MA0-S 2015-Paper 2FR-Q7) - *NUMBER*

In Kuran's school, 40% of the pupils are boys.

(a) Write 40% as a fraction.

Give your fraction in its simplest form.

.....
(2)

(b) What percentage of the pupils in Kuran's school are girls?

..... %
(1)

In Year 11, there are 70 girls and 42 boys.

(c) Write down the ratio of the number of girls to the number of boys in Year 11

Give your ratio in the form $1 : n$

.....
(2)

(Total for Question is 5 marks)



5 - (4MA0-S 2015-Paper 2FR-Q8) - NUMBER

Neha writes

$$4 + 9 \times 3 = 13 \times 3 = 39$$

Her teacher says that Neha has made a mistake.

(a) What mistake has Neha made?

(1)

Neha is given two more calculations to do.

Her teacher says that Neha must show one stage of working and then the answer for each calculation.

(b) Complete the calculations showing one stage of working and the answer.

(i) $24 \div 6 - 3 = \dots\dots\dots = \dots\dots\dots$

(ii) $45 \div (5 + 4) = \dots\dots\dots = \dots\dots\dots$

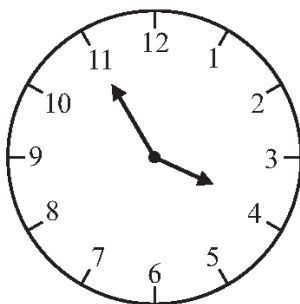
(2)

(Total for Question is 3 marks)



6 - (4MA0-S 2015-Paper 2FR-Q12) - NUMBER

Saki arrives at the railway station in Tokyo.
The clock shows the time in the afternoon that she arrived.



(a) Write this time using the 24-hour clock.

.....
(1)

Saki's train leaves Tokyo at 16 50 and arrives in Kyoto at 19 12

(b) (i) Write 16 50 using the 12-hour clock.

.....
(ii) Find the time taken by the train to travel from Tokyo to Kyoto.

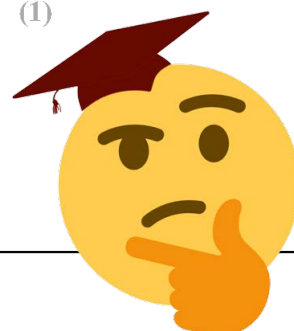
..... hours minutes
(3)

The train continues to Hakata.

It leaves Kyoto at 19 14 and takes 2 hours 45 minutes to reach Hakata.

(c) Work out the time that the train arrives in Hakata.

.....
(1)



The distance from Kyoto to Hakata is 638 kilometres.

The train journey from Kyoto to Hakata takes 2 hours 45 minutes.

(d) Work out the average speed, in kilometres per hour, of the train from Kyoto to Hakata.

..... km/h
(3)

(Total for Question is 8 marks)



7 - (4MA0-S 2015-Paper 2FR-Q15) - NUMBER

(a) Find the square number that is between 169 and 225

.....
(1)

(b) Find the cube number that is between 216 and 512

.....
(1)

(c) Find the prime number that is between 90 and 100

.....
(1)

(d) Write $\frac{3 \times 3 \times 3 \times 3 \times 3 \times 3}{3 \times 3}$ as a single power of 3

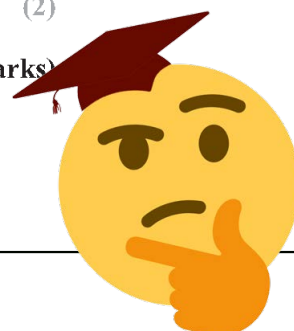
.....
(1)

(e) (i) Find the cube root of 35
Write down the first five figures on your calculator display.

(ii) Write your answer to part (i) correct to 2 significant figures.

.....
(2)

(Total for Question 7 is 6 marks)



8 - (4MA0-S 2015-Paper 2FR-Q19) - NUMBER

Amit invests 15 000 rupees.

At the end of one year, his investment has increased by $7\frac{1}{2}\%$

(a) Work out the value of Amit's investment at the end of one year.

..... rupees
(2)

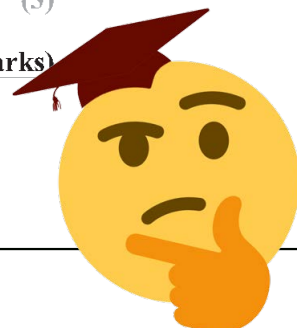
Priya invests a sum of money at an interest rate of 8% per year.

At the end of one year, the interest she receives is 1800 rupees.

(b) Work out the value of Priya's investment at the end of one year.

..... rupees
(3)

(Total for Question is 5 marks)



9 - (4MA0-S 2015-Paper 2FR-Q21) - NUMBER

Flaky pastry is made using flour and fat in the ratio 9:7 by weight.
Cassie makes some flaky pastry.
She uses 175 grams of fat.

(a) Work out the weight of flour Cassie uses.

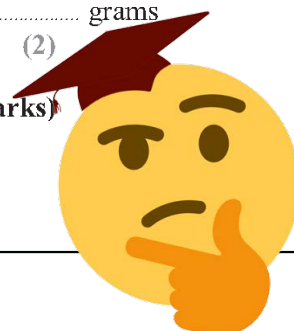
..... grams
(2)

Sweet pastry is made using flour, fat and sugar in the ratio 27:14:9 by weight.
Luke makes some sweet pastry.
The total weight of flour, fat and sugar he uses is 400 grams.

(b) Work out the weight of flour Luke uses.

..... grams
(2)

(Total for Question is 4 marks)



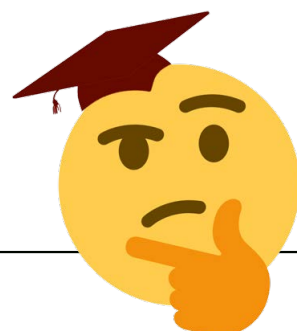
10 - (4MA0-W 2015-Paper 2FR-Q5) - *NUMBER*

Charles makes jam to put in jars.
He uses 340 grams of jam to fill each jar.

Charles makes 3 kg of jam.

Work out the greatest number of jars he can fill.

.....
(Total for Question is 3 marks)



11 - (4MA0-W 2015-Paper 2FR-Q6) - *NUMBER*

Jean gets home at 7 o'clock in the evening.

(a) Write 7 o'clock in the evening using the 24-hour clock.

.....
(1)

Jean is going to watch her favourite TV programme.

The programme starts at 8 40 pm.

The programme lasts for 1 hour 45 minutes.

(b) Work out the time at which the programme ends.

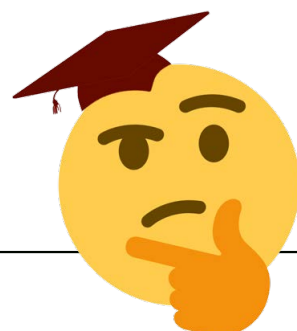
..... pm
(2)

The next programme lasts for 40 minutes.

(c) Write 40 minutes as a fraction of 1 hour.
Give your answer in its simplest form.

.....
(2)

.....
(Total for Question is 5 marks)



12 - (4MA0-W 2015-Paper 2FR-Q8) - *NUMBER*

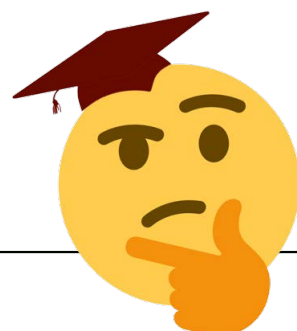
The price of a ticket for a train journey from Bristol to London is £84

Kurt gets $\frac{1}{3}$ off the price of the ticket.

How much does Kurt pay for the ticket?

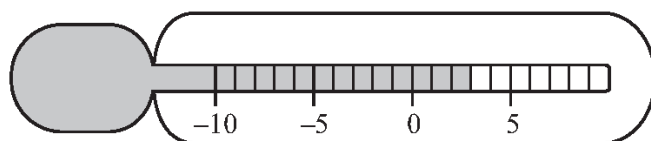
£

(Total for Question is 3 marks)



13 - (4MA0-W 2015-Paper 2FR-Q13) - *NUMBER*

Here is a thermometer in a refrigerator.



(a) What temperature is shown on the thermometer?

..... °C
(1)

The temperature in a freezer is 17°C lower than the temperature in the refrigerator.

(b) Work out the temperature in the freezer.

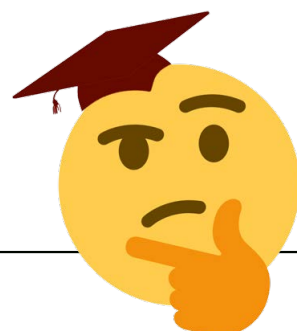
..... °C
(1)

Room temperature is 20°C .

(c) Work out the difference between room temperature and the temperature in the freezer.

..... °C
(1)

(Total for Question is 3 marks)



14 - (4MA0-W 2015-Paper 2FR-Q15) - *NUMBER*

Some of the land in the Netherlands is used to grow bulbs.

The table shows the percentages of this land used to grow the different types of bulbs.

Type of bulb	Hyacinth	Tulip	Daffodil	Lily	Other
Percentage	8%	50%	12%	$x\%$	7%

(a) Work out the value of x .

$$x = \dots\dots\dots$$

(1)

The area of land used to grow bulbs for hyacinths is 1200 hectares.

(b) Work out the area of land used to grow bulbs for daffodils.

$$\dots\dots\dots \text{hectares}$$

(2)

(Total for Question is 3 marks)



15 - (4MA0-W 2015-Paper 2FR-Q21) - NUMBER

Here are some rows of a number pattern.

Row number	Column 1	Column 2	Column 3
1	$1 \times 3 + 1$	4	2^2
2	$2 \times 4 + 1$	9	3^2
3	$3 \times 5 + 1$	16	4^2
$\vdots$	$\vdots$	$\vdots$	$\vdots$
8			
n			

(a) Complete Row number 8

(2)

(b) Write down the Row number of the row that has 400 in Column 2

.....
(1)

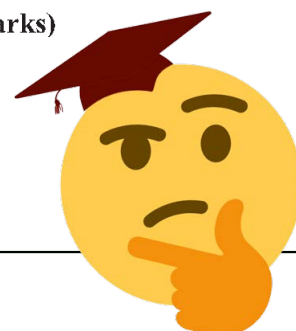
(c) For Row number n ,

(i) write down an expression, in terms of n , that should go in Column 1

.....
(2)

(ii) write down an expression, in terms of n , that should go in Column 3

(Total for Question 15 is 5 marks)



16 - (4MA0-W 2015-Paper 2FR-Q25) - NUMBER

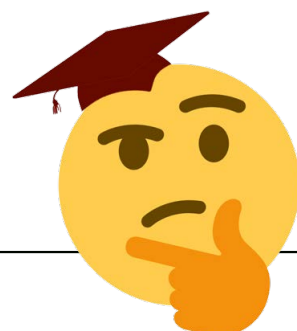
- (a) Write 224 as a product of powers of its prime factors.
Show your working clearly.

.....
(3)

- (b) Write down 3 **different** factors of 224 with a sum between 99 and 110

.....
(2)

(Total for Question is 5 marks)



17 - (4MA0-S 2016-Paper 2FR-Q2) - NUMBER

(a) Work out 10% of 180

.....
(1)

(b) Work out $\frac{1}{4}$ of 160 yuan.

..... yuan
(1)

(c) Shade $\frac{5}{6}$ of this shape.



(1)



18 - (4MA0-S 2016-Paper 2FR-Q6) - NUMBER

Here is some information about five World Heritage sites.

World Heritage site	Country	Age (years)
Great Pyramid	Egypt	4576
Leaning Tower of Pisa	Italy	644
Statue of Liberty	USA	131
Acropolis	Greece	2466
Terracotta Army	China	2236

- (a) Write the numbers in the Age column in order of size.
Start with the smallest number.

.....
(1)

- (b) Work out the difference between the age of the Acropolis and the age of the Leaning Tower of Pisa.

..... years
(1)

The age of each site is the number of years from the year when the site was finished to the year 2016

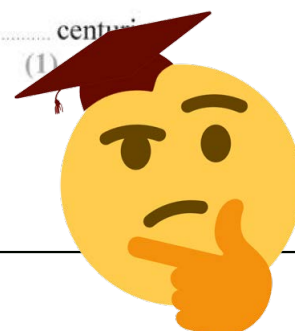
- (c) In what year was the Statue of Liberty finished?

.....
(1)

A century is 100 years.

- (d) How many whole centuries are there in the age of the Terracotta Army?

..... centuries
(1)



19 - (4MA0-S 2016-Paper 2FR-Q7) - NUMBER

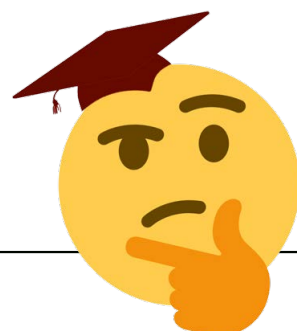
Nikos buys

4 cans of cola at 1.25 euros each
and 2 sandwiches at 2.90 euros each.

He pays with a 20 euro note.

Work out how much change Nikos should get.

.....euros



20 - (4MA0-S 2016-Paper 2FR-Q12) - NUMBER

The temperature at midnight in Oslo on 31st January 2015 was -7°C

The temperature at midnight in Athens on 31st January 2015 was 20°C higher than the temperature in Oslo.

(a) Work out the temperature at midnight in Athens on 31st January 2015

..... $^{\circ}\text{C}$
(2)

Here are the temperatures in Madrid at midnight for one week.

-7°C -6°C -1°C 4°C 0°C 0°C 3°C

(b) Work out the mean temperature.

..... $^{\circ}\text{C}$
(2)

(c) Work out the range.

..... $^{\circ}\text{C}$
(2)



21 - (4MA0-S 2016-Paper 2FR-Q13) - NUMBER

This rule can be used to work out the cost of a taxi ride.

$$\text{Cost in euros} = 2.50 + 2.95 \times \text{number of kilometres of the taxi ride}$$

(a) Work out the cost of a taxi ride of 3 kilometres.

..... euros

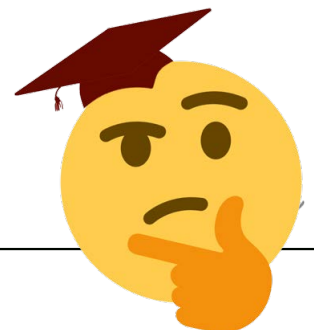
(2)

Jenny has a taxi ride.
The cost is 26.10 euros.

(b) Work out the number of kilometres of the taxi ride.

..... kilometres

(3)



22 - (4MA0-S 2016-Paper 2FR-Q14) - NUMBER

Here are four numbers.

$$\frac{5}{8} \quad 58\% \quad 0.6 \quad \frac{31}{50}$$

- (a) Write these numbers in order of size.
Start with the smallest number.

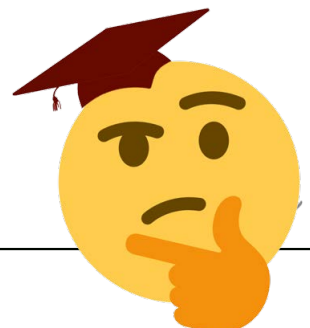
.....
(2)

At a school, $\frac{5}{8}$ of the teachers are male.

There are 72 teachers at the school.

- (b) Work out how many **female** teachers there are at the school.

.....
(3)



23 - (4MA0-S 2016-Paper 2FR-Q16) - *NUMBER*

Show that $\frac{3}{8} + \frac{5}{24} = \frac{7}{12}$

2 marks



24 - (4MA0-S 2016-Paper 2FR-Q18) - *NUMBER*

There were 2.1 million people living in Dubai in 2013
1.75 million of these people were not born in Dubai.

- (a) Work out 1.75 as a percentage of 2.1
Give your answer correct to 1 decimal place.

..... %
(2)

The unit of currency in Dubai is the dirham.
The exchange rate is £1 = 5.52 dirham.

The cost of a pair of running shoes in Dubai is 343 dirham.
The cost of an identical pair of running shoes in the UK is £54.99

The pair of running shoes is more expensive in Dubai than in the UK.

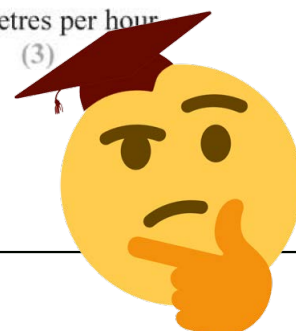
- (b) How much more expensive?
Give your answer to the nearest dirham.

..... dirham
(3)

A plane flies a distance of 5522 km from London to Abu Dhabi in 7 hours 24 minutes.

- (c) Work out the average speed of the plane.
Give your answer in kilometres per hour, correct to 3 significant figures.

..... kilometres per hour
(3)



25 - (4MA0-S 2016-Paper 2FR-Q23) - NUMBER

Louis makes a model of a plane.

The wingspan of the model is 50 centimetres.

The wingspan of the real plane is 80 metres.

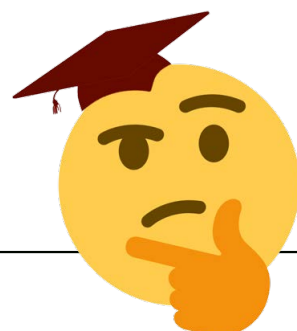
- (a) Work out the scale of the model.
Give your answer in the form 1: n

1:
(2)

The length of the real plane is 72 metres.

- (b) Work out the length of the model.
Give your answer in centimetres.

.....centimetres
(2)



26 - (4MA0-W 2016-Paper 2FR-Q1) - NUMBER

- (a) Write these numbers in order of size.
Start with the smallest number.

3 -2 -9 5 -11

.....
(1)

- (b) Write these decimals in order of size.
Start with the smallest decimal.

0.7 0.072 0.72 0.703 0.007

.....
(1)

- (c) Write 0.7 as a percentage.

..... %
(1)

- (d) Work out $2^3 + \sqrt{144}$

.....
(2)

.....
(Total for Question 26 is 5 marks)



27 - (4MA0-W 2016-Paper 2FR-Q2) - NUMBER

The table shows the heights of the six highest mountains in the world.

Mountain	Height in metres
Everest	8850
K2	8611
Kangchenjunga	8586
Lhotse I	8516
Makalu I	8463
Cho Oyu	8201

(a) Write the number 8201 in words.

.....
(1)

(b) Write down the value of the 4 in the number 8463

.....
(1)

(c) Which number in the table is a multiple of 10?

.....
(1)

(d) Write the number 8586 correct to the nearest thousand.

.....
(1)

(e) What is the difference between the height of Everest and the height of K2?

..... metres
(1)

Two numbers in the table when written correct to the nearest hundred give 8500

(f) Write down these two numbers.

..... and
(2)



(g) What is the number halfway between 8516 and 8586?

.....
(2)

(h) Change 8850 metres to kilometres.

..... kilometres
(1)

(Total for Question is 10 marks)



28 - (4MA0-W 2016-Paper 2FR-Q3) - NUMBER

(a) (i) Write the number on the dotted line to make the calculation correct.

$$283 + \dots\dots\dots = 576$$

(ii) Write the number on the dotted line to make the calculation correct.

$$50\% \text{ of } \dots\dots\dots = 9.7$$

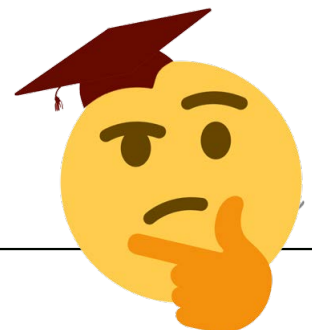
(2)

(b) Write brackets in this calculation so that the answer is correct.

$$7 - 2 \times 5 + 7 = 60$$

(1)

(Total for Question is 3 marks)



29 - (4MA0-W 2016-Paper 2FR-Q9) - NUMBER



The clock face shows the time in the **evening** that James got home from work.

(a) Write this time using the 24-hour clock.

.....
(1)

Later that evening James watched a film on TV.

The film started at 19 50

The film lasted 1 hour 25 minutes.

(b) At what time did the film end?

Give your answer using the 12-hour clock.

.....
(2)

(Total for Question is 3 marks)



30 - (4MA0-W 2016-Paper 2FR-Q13) - *NUMBER*

Timothy buys

two loaves of bread at \$2.43 each

one jar of jam at \$2.29

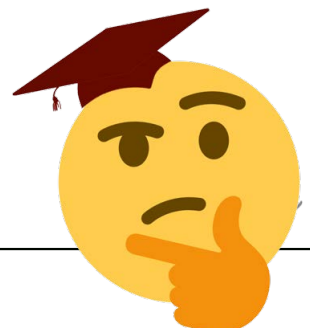
$\frac{1}{2}$ kg of cheese at \$9.54 per kg

Timothy pays with a \$20 note.

How much change should Timothy get?

\$

(Total for Question is 3 marks)



31 - (4MA0-W 2016-Paper 2FR-Q16) - NUMBER

Ying eats some yoghurt.

Ying's recommended number of calories each day is 2500
The yoghurt contains 175 calories.



- (a) Write 175 as a fraction of 2500
Give your fraction in its simplest form.

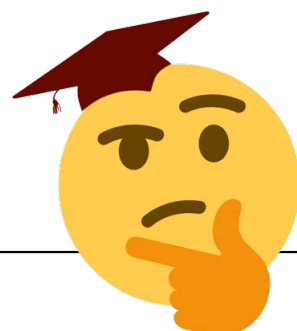
.....
(2)

The yoghurt contains 192 mg of calcium.
This is 16% of the total amount of calcium that Ying should have each day.

- (b) Work out the total amount of calcium that Ying should have each day.

..... mg
(3)

(Total for Question is 5 marks)



32 - (4MA0-W 2016-Paper 2FR-Q19) - *NUMBER*

A plane flew from Bogotá to Quito.

The distance the plane flew was 725 km.

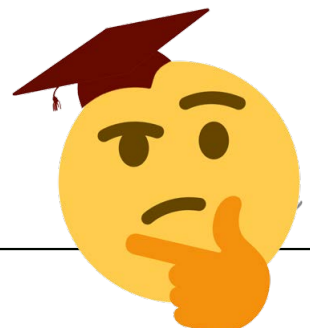
The time taken by the plane was 1 hour 24 minutes.

Work out the average speed of the plane.

Give your answer correct to 3 significant figures.

..... km/h

(Total for Question is 3 marks)



33 - (4MA0-W 2016-Paper 2FR-Q21) - *NUMBER*

Show that $\frac{3}{4} + \frac{4}{5} = 1\frac{11}{20}$

(Total for Question is 2 marks)



34 - (4MA0-W 2016-Paper 2FR-Q22) - NUMBER

Here is a list of ingredients needed to make 16 cookies.

Ingredients for 16 cookies
120 g butter
150 g sugar
240 g flour
170 g chocolate
1 egg

Max wants to make 40 cookies.

(a) How much flour does Max need?

..... g
(2)

Abby made cookies to sell at a school fair.
She used 600 g of butter.

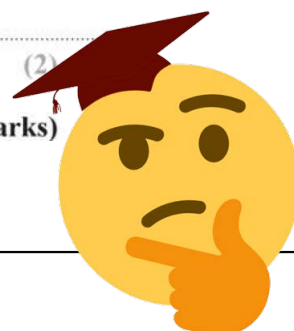
(b) How many cookies did she make?

.....
(2)

(c) Find the ratio of the weight of sugar to the weight of flour in the list of ingredients.
Give your answer in the form 1: n

1 :
(2)

(Total for Question is 6 marks)



35 - (4MA0-S 2017-Paper 2FR-Q1) - *NUMBER*

(a) Write in figures the number twenty four thousand and sixteen.

.....
(1)

(b) Write the number 87655 correct to the nearest thousand.

.....
(1)

(c) Write down the value of the 3 in the number 4.39

.....
(1)

(d) Write down a multiple of 7 that is between 40 and 50

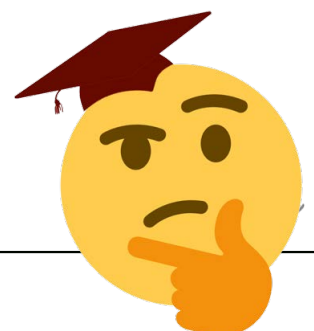
.....
(1)

(e) Work out $\frac{5}{8}$ of 48

.....
(2)

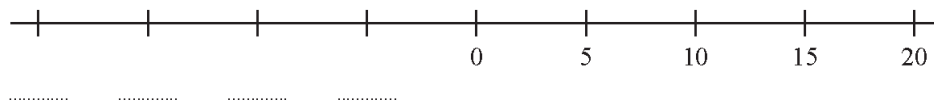
(f) Work out 60% of 750

.....
(2)



36 - (4MA0-S 2017-Paper 2FR-Q3) - NUMBER

Here is an incomplete number line.



(a) Write a number on each dotted line to complete the number line.

(1)

(b) Write the following numbers in order of size.
Start with the smallest number.

5 -7 3 -2 8 -4

.....
(1)

In Oymyakon, the average maximum temperature in July is 72°F .
The average minimum temperature in January is -58°F .

(c) Work out the difference between 72°F and -58°F .

..... $^{\circ}\text{F}$
(2)



37 - (4MA0-S 2017-Paper 2FR-Q5) - NUMBER

(a) Write a number in each box so that each calculation is correct.

(i) + 653 = 871

(ii) $\times 3^2 = 2142$

(iii) $\div 11 = 243$

(iv) $- 2^3 = 16$

(4)

(b) Write brackets in the following calculation so that the answer is correct.

$$7 \times 3 + 8 - 2 = 75$$

(1)

(c) Find the square root of 1521

.....
(1)

(d) Work out the value of $10^4 + 8^2 + 6^3$

.....
(2)



38 - (4MA0-S 2017-Paper 2FR-Q7) - *NUMBER*

(a) Complete the following sentences by writing a sensible metric unit on each of the dotted lines.

(i) The length of a pen is 14

(ii) The weight of a television set is 16

(iii) The area of a classroom floor is 60

(3)

Roberta has a jug containing 2 litres of juice.

She pours 150 millilitres of juice from the jug into each of 3 glasses.

(b) Work out the amount of juice still in the jug.

You must give the units of your answer.

.....
(3)



39 - (4MA0-S 2017-Paper 2FR-Q11) - *NUMBER*

Amandine worked in a restaurant from 6 30 pm to 10 15 pm one evening.

(a) Write 6 30 pm as a time using the 24-hour clock.

.....
(1)

(b) Work out the length of time between 6 30 pm and 10 15 pm.

..... hours minutes
(2)

Rachel and Alan arrived at the restaurant at 7 50 pm.

They stayed at the restaurant for 1 hour 35 minutes.

(c) At what time did Rachel and Alan leave the restaurant?

.....
(1)



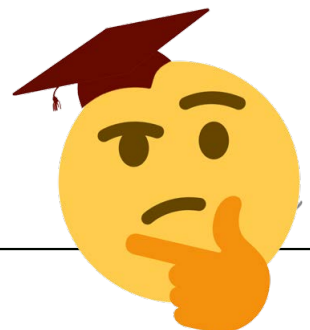
40 - (4MA0-S 2017-Paper 2FR-Q12) - *NUMBER*

At a coffee morning, Mairi is selling drinks.
She sells coffee and tea.
Mairi is also selling cakes.
She sells brownies, doughnuts and flapjacks.

Frankie buys one drink and one cake.

Write down all the possible combinations Frankie can buy.

2 marks



41 - (4MA0-S 2017-Paper 2FR-Q17) - *NUMBER*

Here is a list of ingredients to make 12 chocolate cupcakes.

Chocolate cupcakes

Ingredients for **12** cupcakes

110 g butter

100 g sugar

75 g flour

25 g cocoa

2 eggs

James wants to make exactly 30 cupcakes.

(a) How much butter does James need?

..... g
(2)

Sophie made some chocolate cupcakes for a party.
She used 375 g of sugar.

(b) How many cupcakes did Sophie make?

.....
(2)



42 - (4MA0-S 2017-Paper 2FR-Q19) - *NUMBER*

Work out the value of $\frac{17.7 \times 5.8}{\sqrt{3.4 + 5.3}}$

Write down all the figures on your calculator display.

.....
[2 marks]



43 - (4MA0-S 2017-Paper 2FR-Q24) - *NUMBER*

Show that $3\frac{1}{5} \div 2\frac{2}{3} = 1\frac{1}{5}$

3 marks



44 - (4MA0-W 2017-Paper 2FR-Q1) - *NUMBER*

The table shows the heights of six mountains.

Mountain	Height (metres)
Aconcagua	6959
Ben Nevis	1344
Kilimanjaro	5895
Bogong	1986
Everest	8848
Steele	5073

(a) What is the smallest odd number in the table?

.....
(1)

(b) Write down the value of the 3 in the number 1344

.....
(1)

The height of Everest is greater than the height of Aconcagua.

(c) How many metres greater?

..... metres
(1)

(Total for Question is 3 marks)



45 - (4MA0-W 2017-Paper 2FR-Q4) - NUMBER

(a) Write down the number that is exactly halfway between 8.6 and 8.7



(b) Write down the number on the scale marked with an arrow.



(c) (i) On this scale, mark with an arrow ($\downarrow$) the number 7.235

(ii) Write 7.235 to the nearest whole number.

.....
(2)

(Total for Question is 4 marks)



46 - (4MA0-W 2017-Paper 2FR-Q6) - NUMBER

Here is a sequence of patterns made from sticks.



Pattern number 1



Pattern number 2



Pattern number 3

(a) Complete the table.

Pattern number	1	2	3	4
Number of sticks	4	7	10	

(1)

(b) Explain how you worked out your answer.

(1)

(c) How many sticks are needed to make Pattern number 12?

(2)

(d) Work out the Pattern number of the pattern made from exactly 67 sticks.

(2)

(Total for Question is 6 marks)



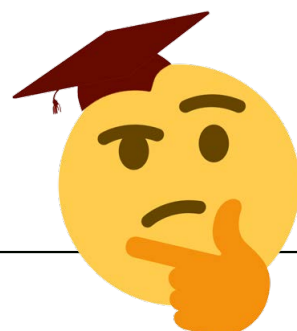
47 - (4MA0-W 2017-Paper 2FR-Q10) - *NUMBER*

Alison buys 6 plants.
The plants cost £2.96 each.
She pays with a £20 note.

Work out how much change Alison should get.

£.....

(Total for Question is 3 marks)



48 - (4MA0-W 2017-Paper 2FR-Q11) - NUMBER

(a) Write 23% as a fraction.

.....
(1)

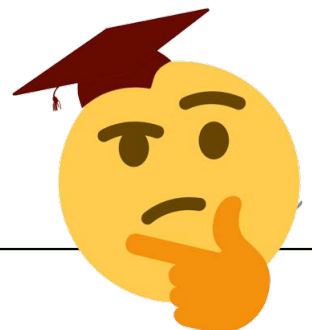
Here are 5 numbers.

$\frac{5}{9}$ 0.59 $\frac{8}{15}$ 61% $\frac{3}{5}$

(b) Write these numbers in order of size.
Start with the smallest number.

.....
(3)

(Total for Question is 4 marks)



49 - (4MA0-W 2017-Paper 2FR-Q13) - NUMBER

(a) Find the cube number that is between 650 and 750

.....
(1)

(b) Find the prime number that is between 85 and 95

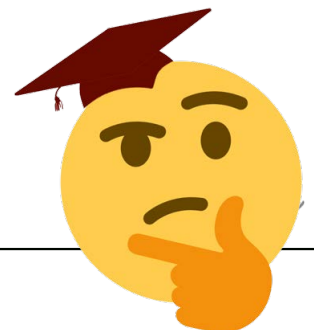
.....
(1)

(c) (i) Find the cube root of 72
Write down all the figures on your calculator display.

.....
(ii) Write your answer to part (i) correct to 2 significant figures.

.....
(2)

(Total for Question is 4 marks)



50 - (4MA0-W 2017-Paper 2FR-Q16) - NUMBER

Here is a list of ingredients for making 24 Rocky Road Crunchy Bars.

Rocky Road Crunchy Bars

Ingredients for 24 bars

125 grams	butter
300 grams	chocolate
3 tablespoons	syrup
200 grams	biscuits
100 grams	marshmallows
2 teaspoons	icing sugar

Silvester wants to make 30 Rocky Road Crunchy Bars.

(a) Work out the amount of marshmallows he needs.

..... grams
(2)

Nigella makes some Rocky Road Crunchy Bars.
She uses 850 grams of chocolate.

(b) Work out the number of Rocky Road Crunchy Bars she makes.

.....
(2)

(Total for Question is 4 marks)



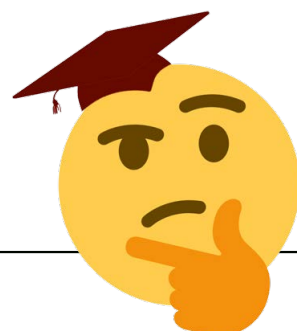
51 - (4MA0-W 2017-Paper 2FR-Q20) - *NUMBER*

In a sale, normal prices are reduced by 35%
The normal price of a bed is \$1200

Work out the sale price of the bed.

\$

(Total for Question is 3 marks)



52 - (4MA0-W 2017-Paper 2FR-Q24) - NUMBER, TRIGONOMETRY

The diagram shows the positions of two towns, A and B .

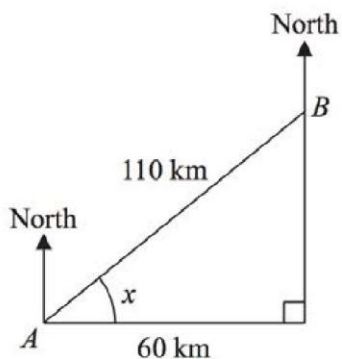


Diagram **NOT**
accurately drawn

The distance from A to B is 110 km.
 B is 60 km east of A .

- (a) Work out the size of angle x .
Give your answer correct to 1 decimal place.

.....
(3)

- (b) Work out the bearing of B from A .
Give your answer correct to the nearest degree.

.....
(2)

The distance from A to B is 110 km correct to 2 significant figures.

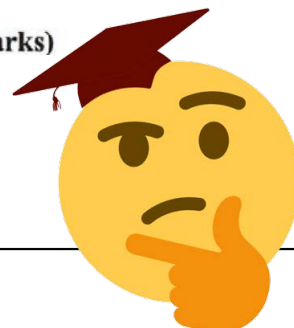
- (c) (i) Write down the lower bound for the distance from A to B .

..... km

- (ii) Write down the upper bound for the distance from A to B .

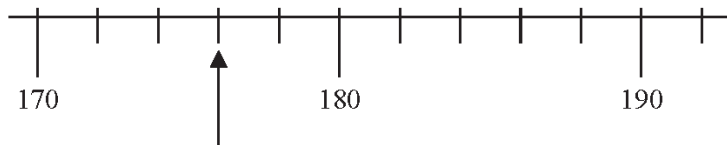
..... km
(2)

(Total for Question is 7 marks)



53 - (4MA0-S 2018-Paper 2FR-Q1) - NUMBER

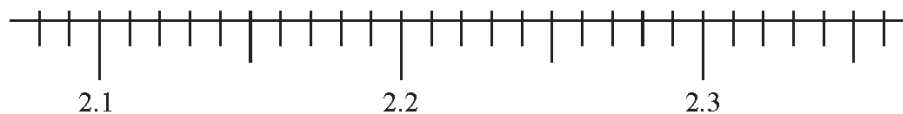
(a)



Write down the number marked with the arrow.

(1)

(b) (i)



Mark with an arrow (↑) the number 2.28

(ii) Write a number on the dotted line to make the calculation correct.

$$2.18 + \dots = 2.26$$

(2)

(c) Write these decimals in order of size.
Start with the smallest decimal.

0.063 0.6 0.07 0.77 0.0011

(1)

(d) Find the number that is exactly halfway between 12.9 and 13.7

(2)



54 - (4MA0-S 2018-Paper 2FR-Q2) - *NUMBER*

(a) Complete the following sentences by writing a sensible metric unit on each of the dotted lines.

(i) The amount of water in a glass is 200

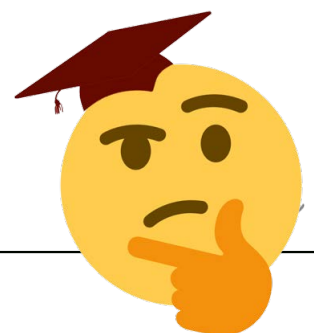
(ii) The width of a book is 16

(2)

(b) Change 4.3 kilometres into metres.

.....metres

(1)



55 - (4MA0-S 2018-Paper 2FR-Q4) - NUMBER

(a) Write the number **six thousand and seventy nine** in digits.

.....
(1)

(b) Write down the value of the 4 in the number 9417

.....
(1)

(c) Write the number 72.163 correct to 1 decimal place.

.....
(1)

(d) Write down two multiples of 18

..... and
(1)

(e) Write 0.7 as a percentage.

..... %
(1)

(f) Write brackets in this calculation so that the answer is correct.

$$25 + 3 \times 7 - 2 = 40$$

(1)

Here is a list of numbers.

9235

9842

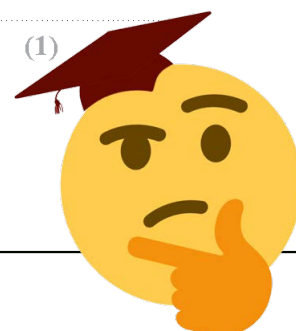
6386

8607

9417

(g) Write down the smallest odd number in the list.

.....
(1)



56 - (4MA0-S 2018-Paper 2FR-Q6) - NUMBER

The table shows the lowest temperature on one day in December for each of six cities.

City	Temperature in °C
Athens	9
Barcelona	6
Bucharest	−3
Kazan	−12
Kiev	−5
Moscow	−9

(a) Which of these cities had the lowest temperature?

.....
(1)

(b) Work out the difference between the lowest temperature in Barcelona and the lowest temperature in Moscow.

..... °C
(1)

In Podgorica, the lowest temperature was 14 °C higher than the lowest temperature in Bucharest.

(c) Work out the lowest temperature in Podgorica.

..... °C
(1)



57 - (4MA0-S 2018-Paper 2FR-Q7) - *NUMBER*

Ahmed buys a rake and some packets of seeds.

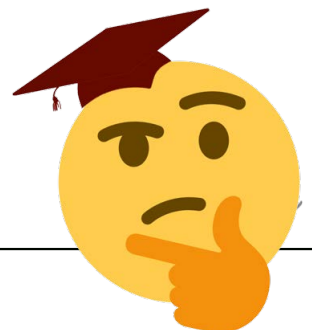
The rake costs \$19.50

Each packet of seeds costs \$1.99

Ahmed pays with two \$20 notes and receives \$8.56 change.

Work out the number of packets of seeds Ahmed buys.

.....
(Total for Question is 4 marks)



58 - (4MA0-S 2018-Paper 2FR-Q9) - NUMBER

Tim arrived at an airport in Boston at 4 45 pm.

(a) Write this time using the 24-hour clock.

.....
(1)

Tim caught a plane to New York from Boston.

The plane left at 6 55 pm.

(b) Work out how many minutes it was from the time when Tim arrived at the airport to the time when the plane left.

.....minutes
(1)

The plane left Boston at 6 55 pm.

The plane took 1 hour 24 minutes to reach New York.

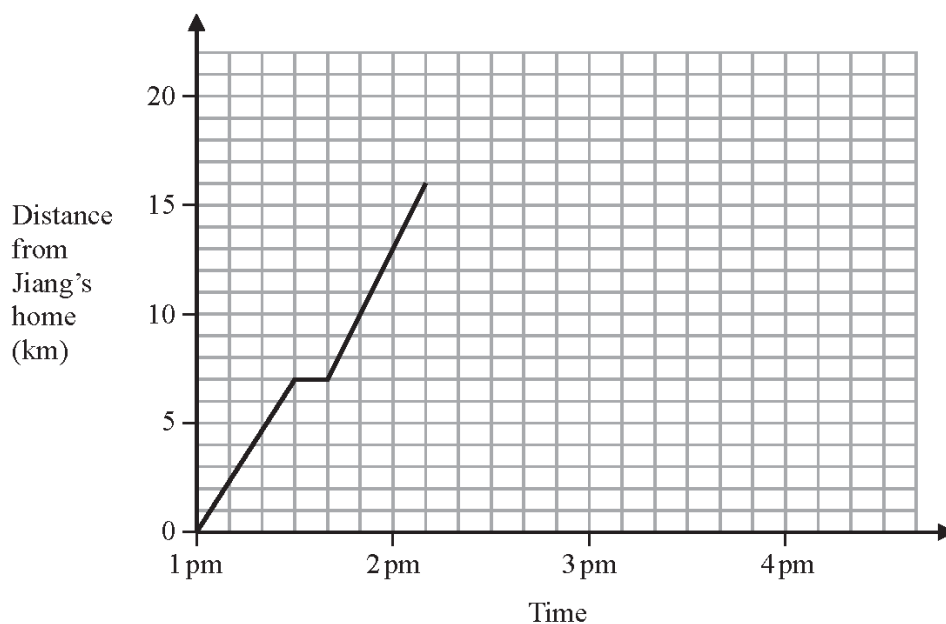
(c) What was the time in Boston when the plane reached New York?

.....
(1)



59 - (4MA0-S 2018-Paper 2FR-Q13) - NUMBER

Jiang left her home at 1 pm to cycle to a bicycle shop.
Here is the travel graph for Jiang's journey to the bicycle shop.



Jiang stopped on the way to the bicycle shop for a rest.

(a) For how long did she stop for a rest?

..... minutes
(1)

(b) Work out Jiang's average speed, in kilometres per hour, for that part of her journey from her home to when she stopped for a rest.

..... kilometres per hour
(2)

Jiang spent 40 minutes at the bicycle shop.
She then cycled home at a constant speed.
She got to her home at 3 50 pm.

(c) Show all this information on the graph.

(2)



60 - (4MA0-S 2018-Paper 2FR-Q14) - NUMBER

1 euro = 1.25 Japanese Yen
1 Canadian dollar = 0.72 euros

Natsuko has 360 Japanese Yen.

Zoe has 425 Canadian dollars.

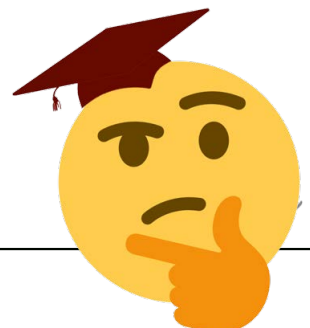
Natsuko and Zoe each change their money into euros.

Zoe gets more euros than Natsuko.

How many more?

.....euros

(Total for Question is 3 marks)



61 - (4MA0-S 2018-Paper 2FR-Q15) - *NUMBER*

Aarav is going to buy a laptop.

The laptop costs 39 000 rupees.

Aarav already has $\frac{1}{3}$ of the cost of the laptop.

He needs to save for the rest of the cost.

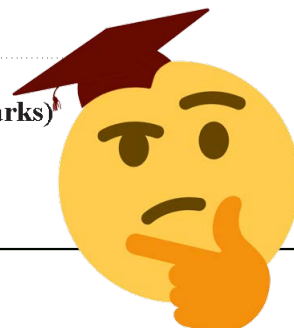
Aarav has a Saturday job.

Each Saturday his pay is 5300 rupees.

He is going to save 55% of his pay.

Work out the number of Saturdays Aarav must work until he has saved the rest of the cost of the laptop.

(Total for Question 61 is 5 marks)



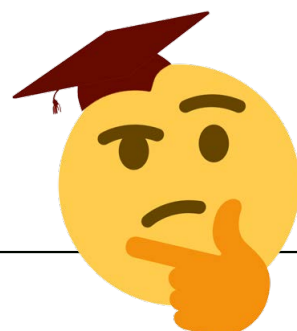
62 - (4MA0-S 2018-Paper 2FR-Q19) - *NUMBER*

Charlotte earns £8.50 per hour.
She gets a pay rise of 6%

Work out how much Charlotte earns per hour after her pay rise.

£

(Total for Question is 3 marks)



63 - (4MA0-S 2018-Paper 2FR-Q24) - *NUMBER*

Write 280 as a product of its prime factors.
Show your working clearly.

.....
(Total for Question is 3 marks)



64 - (4MA0-W 2018-Paper 2FR-Q2) - NUMBER

(a) Write down a prime number that is between 75 and 85

.....
(1)

(b) Write down a multiple of both 8 and 12 that is less than 50

.....
(2)

Here are some numbers in a box.

2	9	18	22	27	31
---	---	----	----	----	----

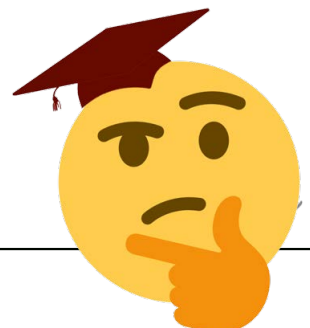
From the numbers in the box, write down

(c) (i) an even number

(ii) the square number

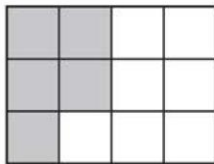
(iii) the cube number

.....
(3)



65 - (4MA0-W 2018-Paper 2FR-Q6) - NUMBER

Here is a shape made of squares.



(a) Write down the fraction of the shape that is shaded.

.....
(1)

(b) Write $\frac{4}{5}$ as a decimal.

.....
(1)

(c) Find a fraction that is equivalent to $\frac{6}{18}$

.....
(1)

71% of the Earth's surface is covered with water.

(d) What percentage of the Earth's surface is not covered with water?

..... %
(1)

The Earth is 4.54 billion years old.

(e) Write the number 4.54 correct to one decimal place.

.....
(1)



66 - (4MA0-W 2018-Paper 2FR-Q7) - NUMBER

(a) Complete the following sentences by writing a sensible metric unit on each of the dotted lines.

(i) The length of a car is 3.4

(ii) The weight of a calculator is 30

(2)

(b) Bradley started a cycle race at 3 12 pm.
He finished the race 2 hours 55 minutes later.

(i) Write 3 12 pm as a time using the 24-hour clock.

.....
(1)

(ii) At what time did Bradley finish the race?

.....
(2)



67 - (4MA0-W 2018-Paper 2FR-Q8) - NUMBER

- (a) Write these numbers in order of size.
Start with the smallest number.

0.16 0.51 0.28 0.09 0.203

.....
(1)

- (b) Write 0.07 as a percentage.

..... %
(1)

- (c) Find the number that is exactly halfway between 9.9 and 10.7

.....
(1)

- (d) Change 4.2 metres to centimetres.

.....centimetres
(1)



68 - (4MA0-W 2018-Paper 2FR-Q13) - NUMBER

A farmer has 190 eggs.
These eggs are packed into identical boxes.

There are 12 eggs in a completely full box.
The farmer completely fills as many boxes as possible with eggs.

(a) Work out the number of boxes the farmer completely fills.

.....
(2)

(b) Work out how many eggs are left over.

.....
(2)



69 - (4MA0-W 2018-Paper 2FR-Q14) - *NUMBER*

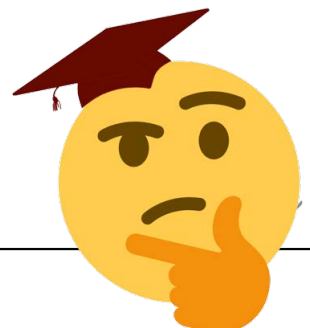
A bag contains only red marbles and green marbles.

The bag contains a total of 400 marbles.

The ratio of the number of red marbles to the number of green marbles is 5 : 3

How many more red marbles are there than green marbles in the bag?

.....
(Total for Question is 3 marks)



70 - (4MA0-W 2018-Paper 2FR-Q15) - NUMBER

In a sale, normal prices are reduced by 12%

The normal price of a shirt is \$36

(a) Work out the sale price of the shirt.

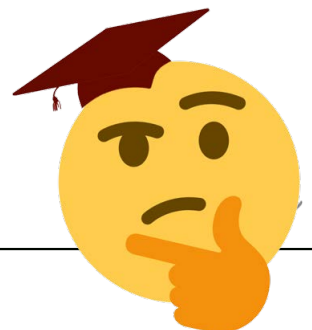
\$.....
(3)

180 items were sold in the sale.

81 of these items were shirts.

(b) Express the number of shirts sold as a percentage of the number of items sold in the sale.

.....%
(2)



71 - (4MA0-W 2018-Paper 2FR-Q20) - NUMBER

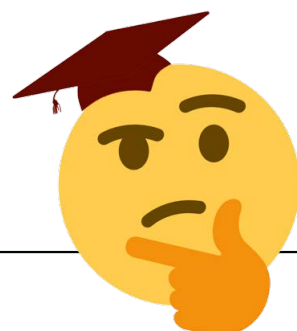
$$1426 = 2 \times 23 \times 31$$

(i) Find all the factors of 1426

.....
(3)

(ii) Write 713 as a product of its prime factors.

.....
(1)



72 - (4MA0-W 2019-Paper 2FR-Q3) - NUMBER

The incomplete table gives some information about the percentages of his income that Mr Chowdhury spent last month.

Item	Percentage of income
food	13%
housing	16%
leisure	8%
clothes	5%
transport	15%
furniture	20%
other items	%

(a) Complete the table to show the percentage of Mr Chowdhury's income spent on other items.

(2)

Mr Chowdhury spent 16% of his income on housing.

(b) Write 16% as a decimal.

(1)

Mr Chowdhury spent 13% of his income on food.

(c) Write 13% as a fraction.

(1)

Mr Chowdhury's income was 8000 taka last month.

(d) Work out 15% of 8000



73 - (4MA0-W 2019-Paper 2FR-Q9) - NUMBER

(a) Find two factors of 36 that have a sum greater than 14 but less than 20

and

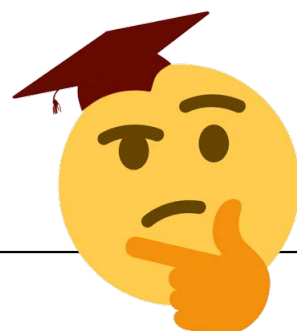
(2)

N is an even number greater than 50

Two factors of the number N are 3 and 5

(b) Write down a possible value of N .

(2)



74 - (4MA0-W 2019-Paper 2FR-Q14) - NUMBER

In a factory, 3 machines each make bottles.

Two of the machines each make 14 bottles every hour.

The other machine makes 18 bottles every hour.

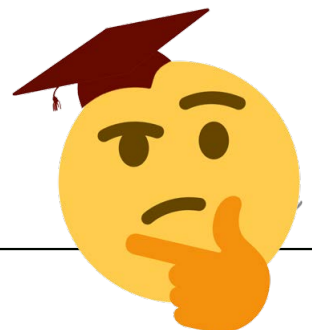
Each machine makes bottles 24 hours a day.

Each machine makes bottles 7 days a week.

When made, the bottles are stored in crates.

When full, each crate holds 120 bottles.

How many crates are needed to store **all** the bottles made by the 3 machines in a week?



75 - (4MA0-W 2019-Paper 2FR-Q16) - NUMBER

Yulia normally lives in Russia.
She buys a car in Cyprus.

The cost of the car is 15 400 euros.

The exchange rate is 1 euro = 63.21 Russian rubles.

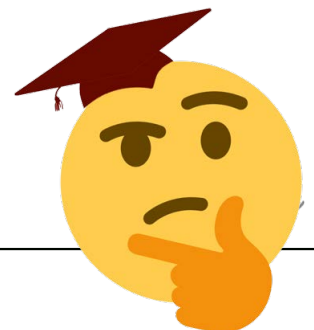
(a) Change 15 400 euros into Russian rubles.

Russian rubles
(2)

The cost of insuring the car is 240 euros.

(b) Express 240 as a percentage of 15 400
Give your answer correct to 2 decimal places.

%
(2)

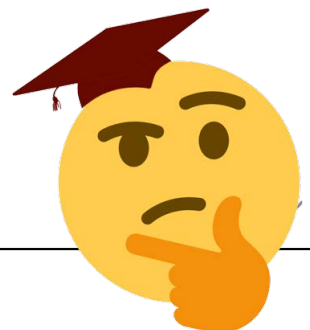


76 - (4MA0-W 2019-Paper 2FR-Q18) - *NUMBER*

An aeroplane takes 11 hours 40 minutes to fly from London to Mauritius.
The aeroplane flies a distance of 9720 kilometres.

Work out the average speed of the aeroplane.
Give your answer in kilometres per hour, correct to the nearest whole number.

kilometres per hour



77 - (4MA0-W 2019-Paper 2FR-Q19) - NUMBER

The length of a car is 472 centimetres.

Mikhail makes a scale model of the car using a scale of 1 : 20

(a) Work out the length of the scale model.

centimetres
(2)

Alis makes a scale model of a bus.

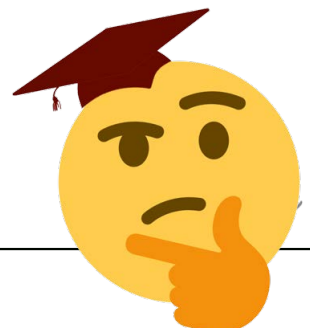
The length of the real bus is 10.8 metres.

The length of the scale model is 60 centimetres.

Alis uses a scale of 1 : n where n is a whole number.

(b) Find the value of n .

$n =$
(3)



78 - (4MA0-W 2019-Paper 2FR-Q22) - *NUMBER*

Show that $2\frac{1}{4} \times \frac{5}{6} = 1\frac{7}{8}$



79 - (4MA0-W 2019-Paper 2FR-Q24) - NUMBER

Eugenia bought 120 watches at 50 dollars each.

She sold $\frac{3}{4}$ of the watches at 80 dollars each.

She then sold all the remaining watches at 40 dollars each.

Work out her percentage profit.

%



1 - (4MA0-S 2015-Paper 2FR-Q16) - ALGEBRA

(a) Solve $7 + x = 15$

$$x = \dots\dots\dots$$

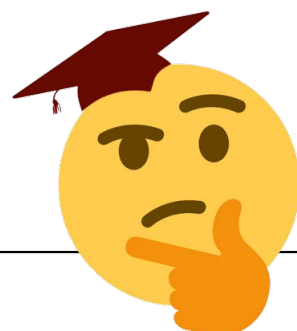
(1)

(b) Solve $-9 = 8y + 3$

$$y = \dots\dots\dots$$

(2)

(Total for Question is 3 marks)



2 - (4MA0-S 2015-Paper 2FR-Q22) - ALGEBRA

(a) Expand $5(2p - 3)$

.....
(1)

(b) Expand and simplify fully $(n + 8)(n - 5)$

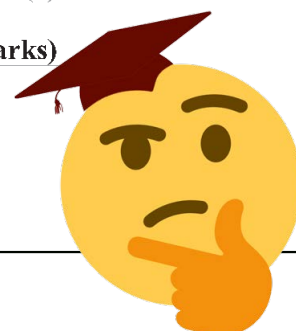
.....
(2)

(c) $y = x^3 - kx + 5$

Work out the value of k when $y = 6$ and $x = -2$

$k =$
(3)

(Total for Question is 6 marks)



3 - (4MA0-W 2015-Paper 2FR-Q9) - ALGEBRA

This rule can be used to work out the total cost in dollars (\$) of hiring a car.

$$\text{Total cost in dollars} = 40 \times \text{number of days} + 50$$

Alex hired a car for 6 days.

(a) Use the rule to work out the total cost.

\$
(2)

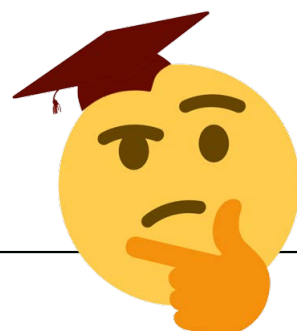
Suresh hired a car.

The total cost was \$410

(b) Use the rule to work out the number of days he hired the car.

.....
(2)

(Total for Question is 4 marks)



4 - (4MA0-W 2015-Paper 2FR-Q10) - ALGEBRA(a) Simplify $2m + 5m$

(1)(b) Simplify $6x - x$

(1)(c) Simplify $6 \times 2y$

(1)

$$t = 4k + 9$$

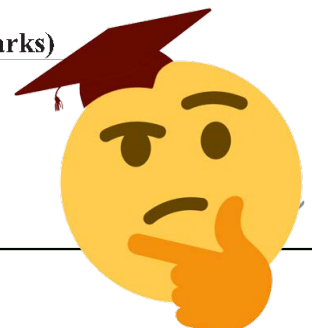
$$k = 2$$

(d) Work out the value of t . $t = \dots\dots\dots$
(1)

$$p = 2n^2$$

$$n = 3$$

(e) Work out the value of p . $p = \dots\dots\dots$
(1)

(Total for Question 4 is 5 marks)

5 - (4MA0-W 2015-Paper 2FR-Q20) - ALGEBRA

Solve $x + 2y = 3$

$$x - y = 6$$

Show clear algebraic working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(Total for Question is 3 marks)

6 - (4MA0-S 2016-Paper 2FR-Q8) - ALGEBRA

(a) Simplify $x + 2x$

$$\dots\dots\dots$$

(1)

(b) Simplify $y \times y \times y$

$$\dots\dots\dots$$

(1)

(c) Simplify $2x \times 3y$

$$\dots\dots\dots$$

(1)

(d) What must be written on the dotted line to make a correct algebraic statement?
Write your answer on the dotted line.

$$6t + 3t - \dots\dots\dots = t$$

(1)



7 - (4MA0-S 2016-Paper 2FR-Q17) - ALGEBRA

(a) Solve $4x + 5 = 13$

$$x = \dots\dots\dots$$

(2)

(b) Solve $6t - 5 = 2t + 9$
Show clear algebraic working.

$$t = \dots\dots\dots$$

(3)

(c) Expand and simplify $3(2y + 2) + 2(y - 4)$

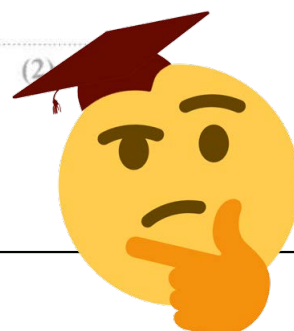
$$\dots\dots\dots$$

(2)

(d) Simplify fully $4wxy \div (8xy)$

$$\dots\dots\dots$$

(2)



8 - (4MA0-W 2016-Paper 2FR-Q8) - ALGEBRA

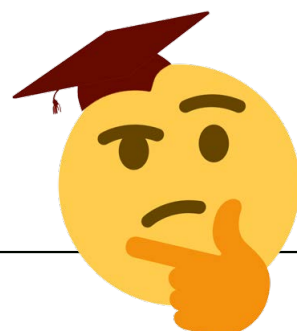
Here is a number machine.



Complete the table.

Input	Output
4	30
7	
	48

(Total for Question is 2 marks)



9 - (4MA0-W 2016-Paper 2FR-Q15) - ALGEBRA

(a) Simplify $e + e + e + e$

.....
(1)

(b) Simplify $4c^2 + 3c^2 - 5c^2$

.....
(1)

(c) Simplify $7a + 5b - 2a - 9b$

.....
(2)

(d) Simplify $7p \times 2q$

.....
(1)

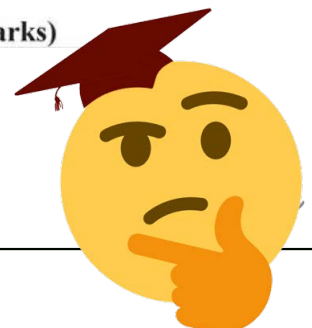
(e) Simplify $x^7 \times x^2$

.....
(1)

(f) Simplify $y^9 \div y^3$

.....
(1)

(Total for Question is 7 marks)



10 - (4MA0-W 2016-Paper 2FR-Q17) - ALGEBRA

(a) Expand and simplify $4(2d + 3) - 2(3d - 5)$

.....
(2)

$$P = 5g + h^2$$

(b) Find the value of P when $g = 3$ and $h = -4$

$P =$
(2)

(Total for Question is 4 marks)



11 - (4MA0-W 2016-Paper 2FR-Q24) - ALGEBRA

(a) Solve $9y - 3 = 5y + 2$

$$y = \dots\dots\dots (2)$$

(b) Solve $\frac{7x - 1}{5} = x$

Show clear algebraic working.

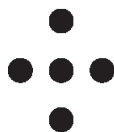
$$x = \dots\dots\dots (3)$$

(Total for Question is 5 marks)

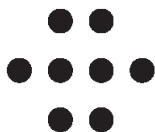


12 - (4MA0-S 2017-Paper 2FR-Q8) - ALGEBRA

Here is a sequence of patterns made from dots.



Pattern
number
1



Pattern
number
2



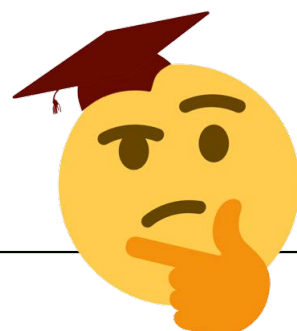
Pattern
number
3

(a) In the space below, draw Pattern number 4

(1)

(b) Find the number of dots in Pattern number 11

(2)



13 - (4MA0-S 2017-Paper 2FR-Q15) - ALGEBRA

(a) Simplify $g \times 9 \times h$

(1)

(b) Simplify $5a + 2m + 3a - 7m$

(2)

(c) Expand $4(3 - 7c)$

(1)

(d) Factorise $y^2 + 8y$

(1)



14 - (4MA0-S 2017-Paper 2FR-Q20) - ALGEBRA(a) Expand and simplify $(x + 7)(x - 3)$

.....
(2)

(b) Solve $5p - 9 = 3p$

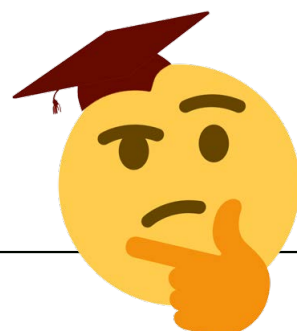
$p =$
(2)

(c) Simplify $y^7 \times y^4$

.....
(1)

(d) Simplify $h^{12} \div h^4$

.....
(1)



15 - (4MA0-S 2017-Paper 2FR-Q21) - ALGEBRA

Solve the simultaneous equations.

$$5x - 2y = 9.5$$

$$4x + 2y = 13$$

Show clear algebraic working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

3 marks)

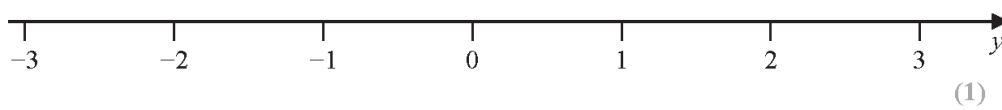


16 - (4MA0-S 2017-Paper 2FR-Q23) - ALGEBRA

(a) Solve the inequality $4x + 13 \geq 27$

.....
(2)

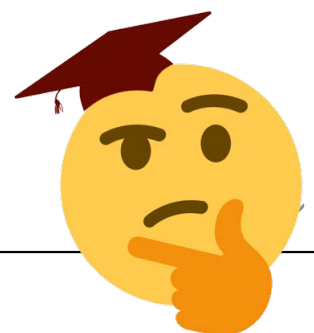
(b) On the number line, represent the inequality $y \geq -1$



n is an integer.

(c) Write down all the values of n that satisfy $-3 < n \leq 2$

.....
(2)



17 - (4MA0-W 2017-Paper 2FR-Q12) - ALGEBRA

(a) Simplify $6e + 8f - 2e + 3f$

.....
(2)

(b) Solve $7x + 11 = 14$

$x =$
(2)

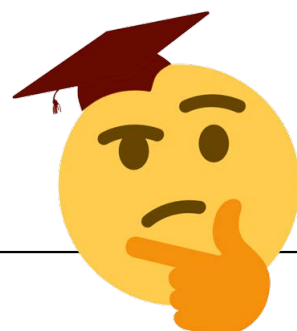
(c) Expand $3(4p + 5)$

.....
(1)

(d) Factorise $6r + 14$

.....
(1)

(Total for Question is 6 marks)



18 - (4MA0-W 2017-Paper 2FR-Q22) - ALGEBRA

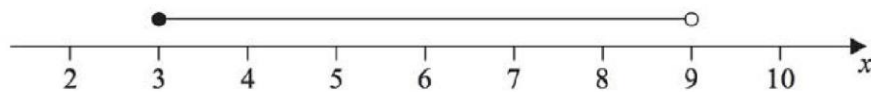
(a) Work out the value of $y^2 - 3y$ when $y = -5$

.....
(2)

(b) Simplify $\frac{w^5 \times w^8}{w^4}$

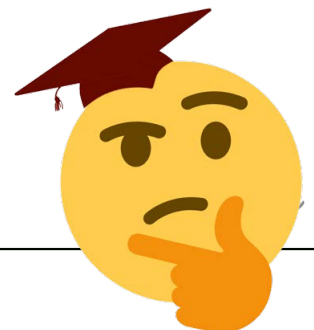
.....
(2)

(c) Write down the inequality shown on the number line.



.....
(2)

(Total for Question is 6 marks)



19 - (4MA0-S 2018-Paper 2FR-Q11) - ALGEBRA(a) Simplify $t + t + t$

.....
(1)

(b) Simplify $3p \times 5q$

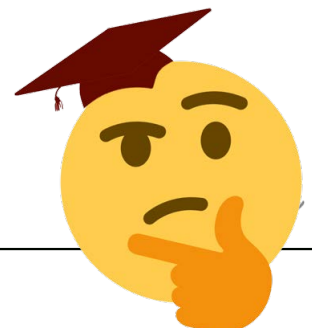
.....
(1)

(c) Expand $4(y - 5)$

.....
(1)

(d) Solve $\frac{8x}{5} = 9.2$

$x =$
(2)



20 - (4MA0-S 2018-Paper 2FR-Q21) - ALGEBRA

Solve the simultaneous equations

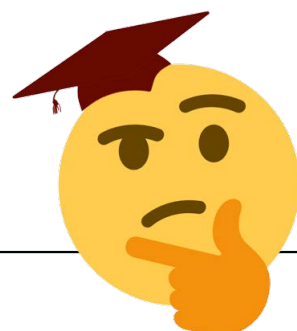
$$\begin{aligned}y &= 4x \\ 7x - y &= -13.5\end{aligned}$$

Show clear algebraic working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(Total for Question is 3 marks)



21 - (4MA0-S 2018-Paper 2FR-Q23) - ALGEBRA(a) Simplify $m^7 \times m^4$

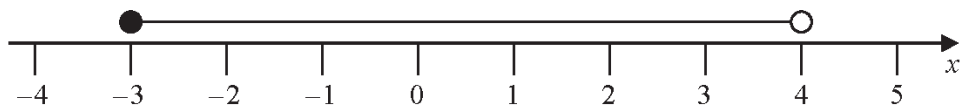
(1)(b) Simplify $(3a^2b^4)^3$

(2)(c) Expand and simplify $4(g - 2h) + 5(2g - 3h)$

(2)(d) Expand and simplify $(y - 7)(y + 5)$

(2)

22 - (4MA0-S 2018-Paper 2FR-Q25) - ALGEBRA



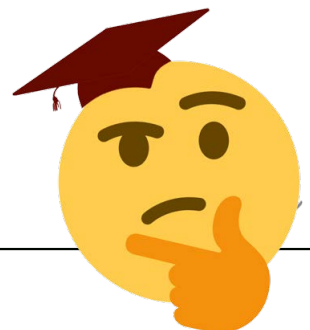
An inequality in x is shown on the number line.

(a) Write down this inequality.

.....
(2)

(b) Solve the inequalities $-5 \leq 2p + 3 < 13$

.....
(3)



23 - (4MA0-W 2018-Paper 2FR-Q9) - ALGEBRA(a) Simplify $e + e + e + e$

(1)(b) Simplify $p \times 4 \times q$

(1)(c) Simplify $5x - 4y + 3x + 7y$

(2)(d) Factorise $4ab + 7a^2 - a$

(2)**24** - (4MA0-W 2018-Paper 2FR-Q10) - ALGEBRA(a) Find the value of $\sqrt{88.36}$

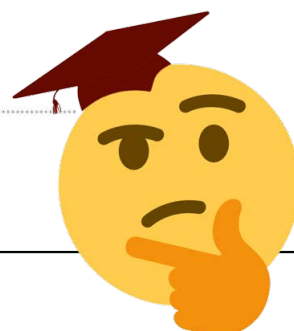
(1)

(b) Find the cube root of 9261

(1)(c) (i) Find the value of 6.1^4

Write down all the figures on your calculator display.

(ii) Write your answer to part (c) (i) correct to 2 significant figures.

(2)

25 - (4MA0-W 2018-Paper 2FR-Q19) - ALGEBRA

(a) Solve the inequality $4 - 8p > 11$

.....
(2)

(b) Expand and simplify $(x + 3)(x - 6)$

.....
(2)

(c) Simplify $\frac{y^{12}}{y^4}$

.....
(1)

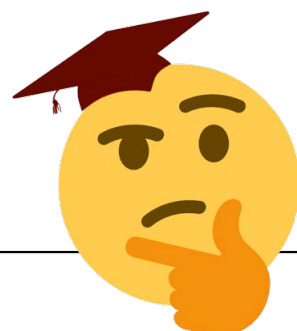
(d) Simplify $(3e)^2$

.....
(2)

$$\frac{2^{11}}{2^2 \times 2^3} = 4^n$$

(e) Find the value of n .

.....
(2)



26 - (4MA0-W 2019-Paper 2FR-Q8) - ALGEBRA

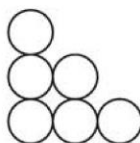
Here is a sequence of patterns made from circles in rows.



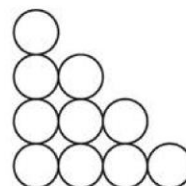
Pattern number 1



Pattern number 2

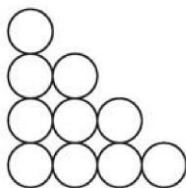


Pattern number 3



Pattern number 4

(a) In the space below, complete Pattern number 5



Pattern number 5

(1)

(b) Find the number of circles in Pattern number 6

(1)

(c) Write down the number of circles in the bottom row of Pattern number 20

(1)

There are more circles in Pattern number 30 than there are in Pattern number 28

(d) How many more?



27 - (4MA0-W 2019-Paper 2FR-Q10) - ALGEBRA

$$y = 2cx + d$$

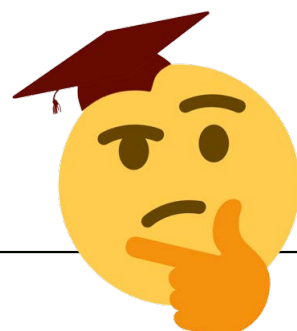
- (a) Find the value of y when $x = 3$, $c = 4$ and $d = -8$

$$y = \quad (2)$$

$$y = 2cx + d$$

- (b) Find an expression for y in terms of c when $x = 2$ and $d = 3c$
Give your answer in its simplest form.

(2)



28 - (4MA0-W 2019-Paper 2FR-Q20) - ALGEBRA

- (a) Solve $5x - 2 = x + 8$
Show clear algebraic working.

$$x = \quad (3)$$

- (b) Factorise $3t - 5ty$

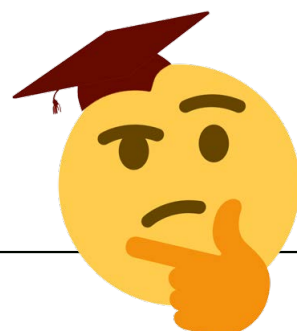
(1)

- (c) Simplify $k^5 \times k$

(1)

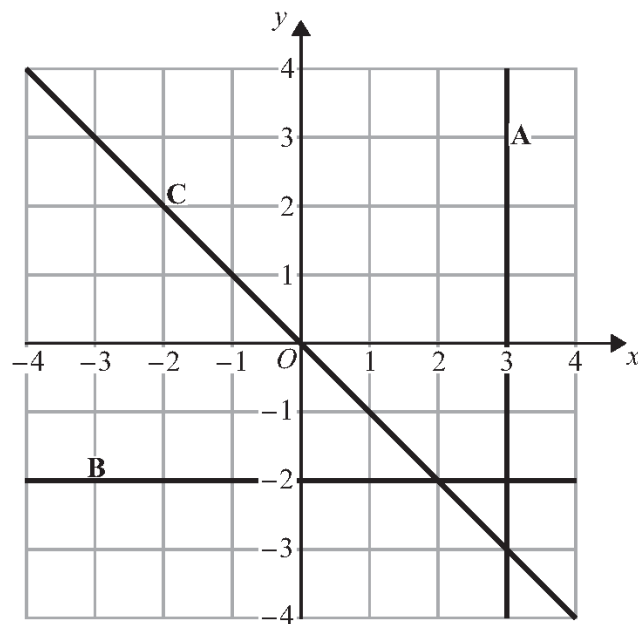
- (d) Solve $\frac{h}{2} - 8 < 5$

(2)



1 - (4MA0-W 2015-Paper 2FR-Q16) - *FUNCTIONS & GRAPHS*

Here are three straight lines **A**, **B** and **C** drawn on a grid.



Write down an equation for each of these three straight lines.

A

B

C

(Total for Question is 3 marks)



2 - (4MA0-W 2015-Paper 2FR-Q17) - *FUNCTIONS & GRAPHS*

Eric travels from the UK to India every year.

In 2010, the exchange rate was £1 = 67.1 rupees.

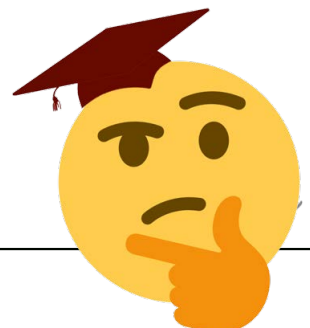
In 2012, the exchange rate was £1 = 82.5 rupees.

In 2010 Eric changed £600 into rupees.

How many pounds (£) did Eric have to change to rupees in 2012 to get the same number of rupees as he did in 2010?

£

(Total for Question is 3 marks)



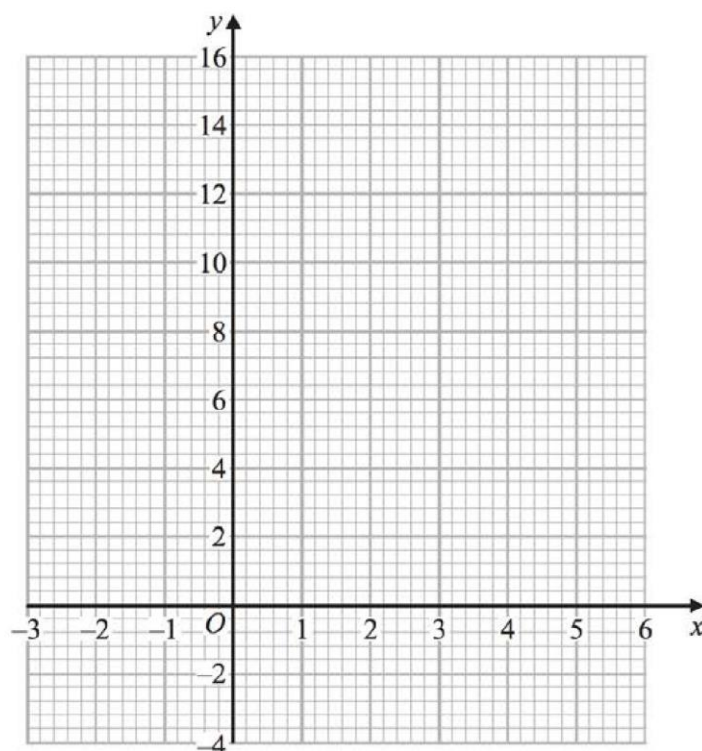
3 - (4MA0-S 2016-Paper 2FR-Q20) - FUNCTIONS & GRAPHS

(a) Complete the table of values for $y = x^2 - 4x + 2$

x	-2	-1	0	1	2	3	4	5
y	14		2			-1	2	

(2)

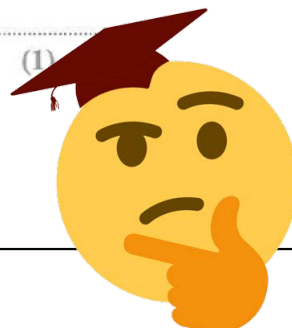
(b) On the grid, draw the graph of $y = x^2 - 4x + 2$ for values of x from -2 to 5



(2)

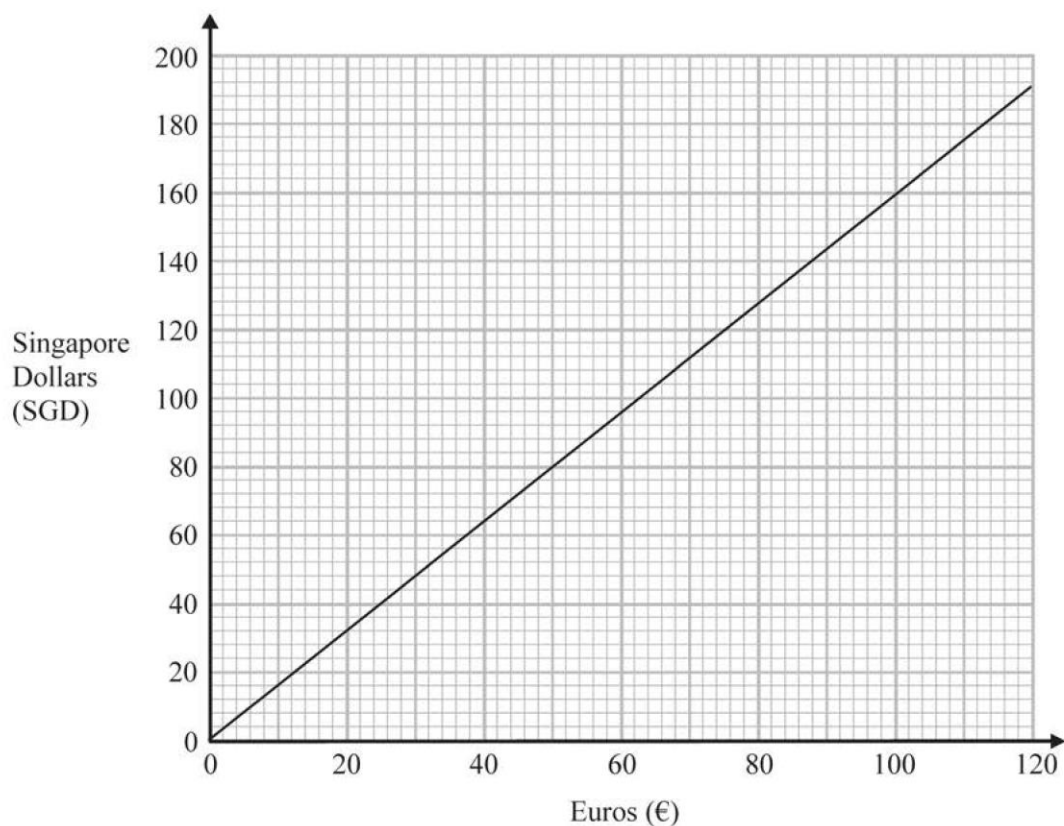
The point $P(k, 4)$ where $k > 0$ lies on the graph of $y = x^2 - 4x + 2$

(c) Use your graph to find an estimate for the value of k .



4 - (4MA0-W 2016-Paper 2FR-Q12) - FUNCTIONS & GRAPHS

You can use this graph to convert between euros (€) and Singapore Dollars (SGD).



(a) Convert 50 euros to Singapore Dollars.

..... SGD
(1)

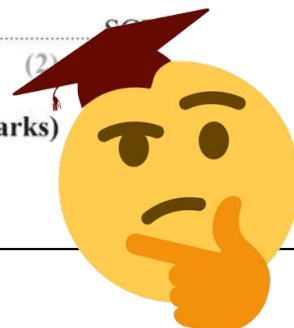
(b) Convert 90 Singapore Dollars to euros.

..... euros
(1)

(c) Convert 550 euros to Singapore Dollars.
Show your working clearly.

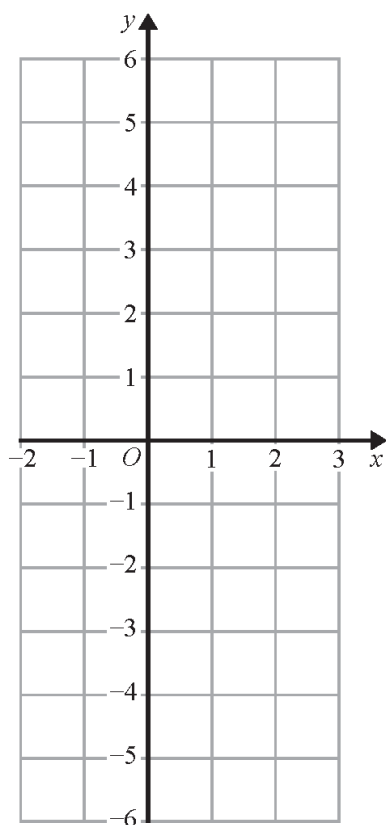
..... SGD
(2)

(Total for Question is 4 marks)



5 - (4MA0-S 2017-Paper 2FR-Q13) - *FUNCTIONS & GRAPHS*

On the grid, draw the graph of $y = 2x - 1$ from $x = -2$ to $x = 3$



3 marks



6 - (4MA0-W 2018-Paper 2FR-Q4) - *FUNCTIONS & GRAPHS*

Here is a number machine.



(a) Find the output when the input is 6

.....
(1)

(b) Find the output when the input is -8

.....
(1)

(c) Find the input when the output is 103

.....
(1)

The input is x .

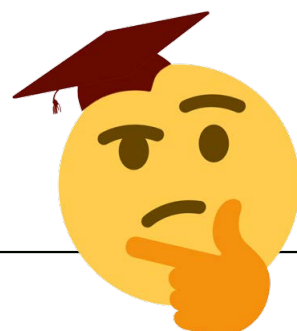
(d) Write down an expression, in terms of x , for the output.

.....
(1)

The output is y .

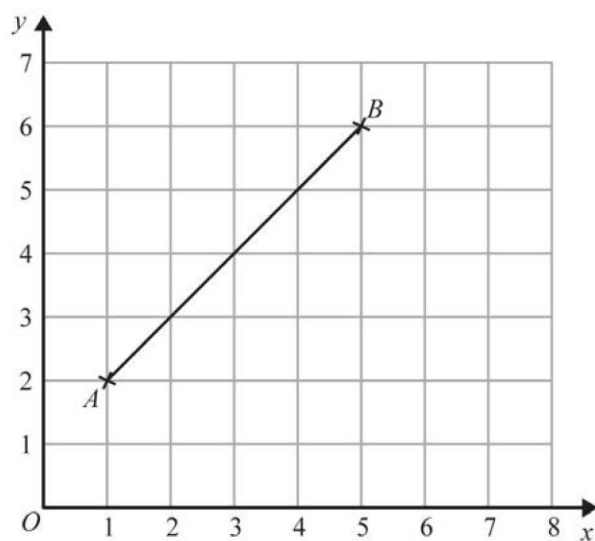
(e) Write down an expression, in terms of y , for the input.

.....
(2)



7 - (4MA0-W 2018-Paper 2FR-Q5) - FUNCTIONS & GRAPHS

The line AB is drawn on a coordinate grid.



(a) Write down the coordinates of the point B .

(.....,)
(1)

The point C has coordinates (5, 0)

(b) On the grid, mark with a cross ($\times$) the point C .

(1)

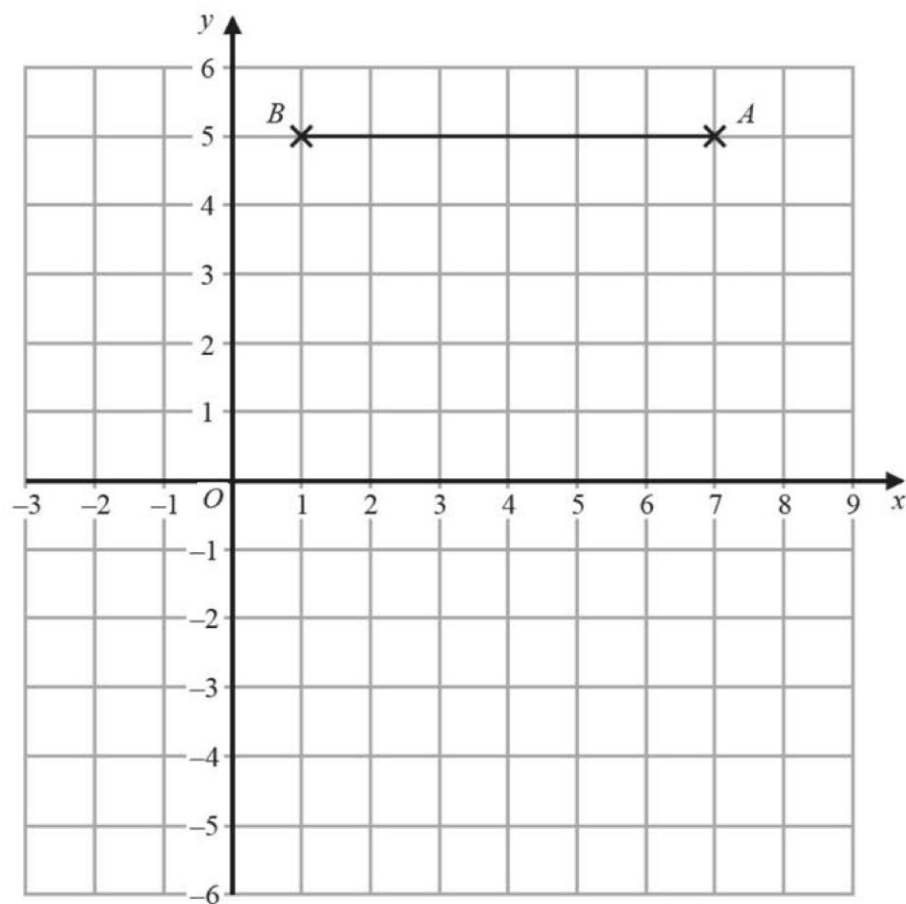
(c) Write down the coordinates of the midpoint of the line AB .

(.....,)
(2)



8 - (4MA0-W 2019-Paper 2FR-Q2) - FUNCTIONS & GRAPHS

The line BA has been drawn on a grid.



(a) Write down the coordinates of the point A .

(,)
(1)

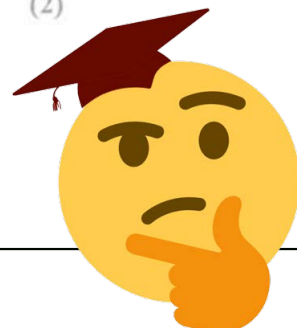
(b) On the grid, mark with a cross (X) the point with coordinates $(-1, -3)$
Label the point C .

(1)

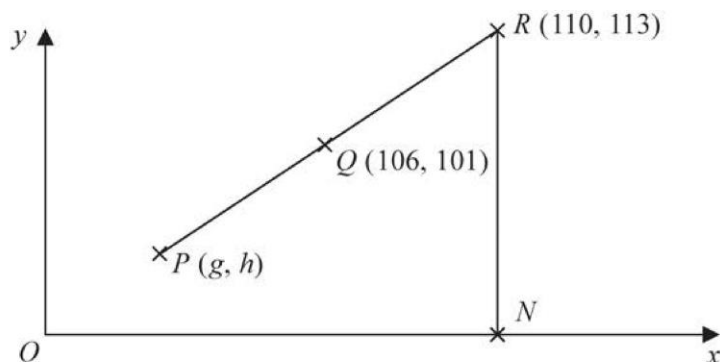
D is the point on the grid so that $ABCD$ is a parallelogram.

(c) Find the coordinates of the point D .

(,)
(2)



9 - (4MA0-W 2019-Paper 2FR-Q15) - FUNCTIONS & GRAPHS

Diagram **NOT**
accurately drawn

Q is the midpoint of the line PR .

(a) Find the value of g and the value of h .

$$g =$$

$$h =$$

(2)

N is the point on the x -axis such that RN is parallel to the y -axis.

M is a point on the line RN .

M is also a point on the straight line with equation $x + y = 130$

(b) Find the coordinates of M .

(,)
(2)



1 - (4MA0-S 2015-Paper 2FR-Q24) - MENSURATION

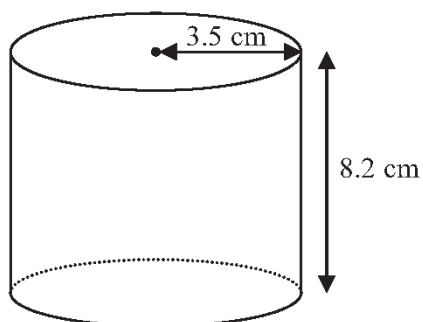


Diagram **NOT**
accurately drawn

A solid cylinder has radius 3.5 cm and height 8.2 cm.

Work out the **total** surface area of the cylinder.
Give your answer correct to 3 significant figures.

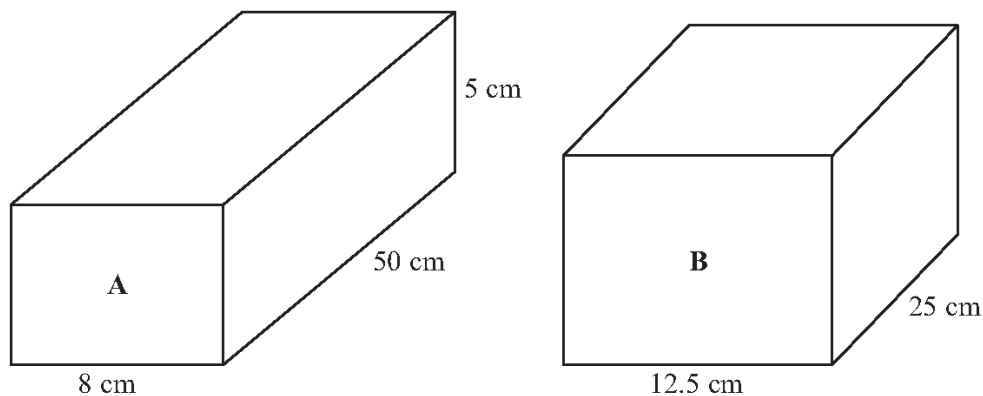
..... cm²

(Total for Question is 3 marks)



2 - (4MA0-W 2015-Paper 2FR-Q14) - MENSURATION

Here are two cuboids, **A** and **B**.



Cuboid **A** has a width of 8 cm, a length of 50 cm and a height of 5 cm.

(a) Calculate the volume of cuboid **A**.

..... cm^3
(2)

Cuboid **B** has a width of 12.5 cm and a length of 25 cm.

Cuboid **B** has the same volume as cuboid **A**.

(b) Calculate the height of cuboid **B**.

..... cm
(3)

(Total for Question is 5 marks)



3 - (4MA0-S 2016-Paper 2FR-Q9) - MENSURATION

Here is a rectangle.

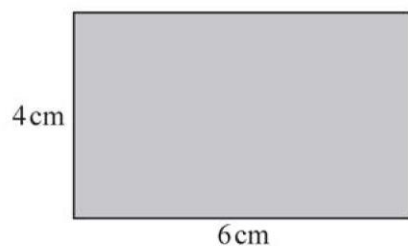


Diagram **NOT**
accurately drawn

(a) Work out the area of the rectangle.

..... cm²
(1)

Two of these rectangles are placed together without overlapping to make this shaded shape.

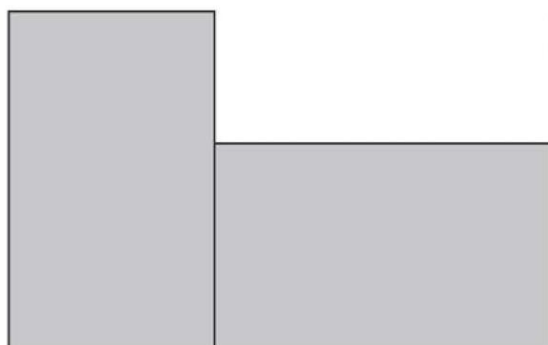
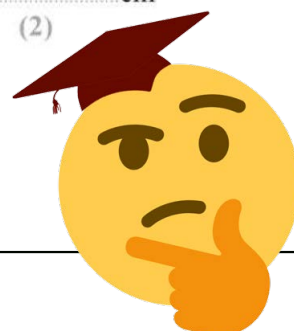


Diagram **NOT**
accurately drawn

(b) Work out the perimeter of the shaded shape.

..... cm
(2)



4 - (4MA0-S 2016-Paper 2FR-Q22) - MENSURATION

Here are two circles.

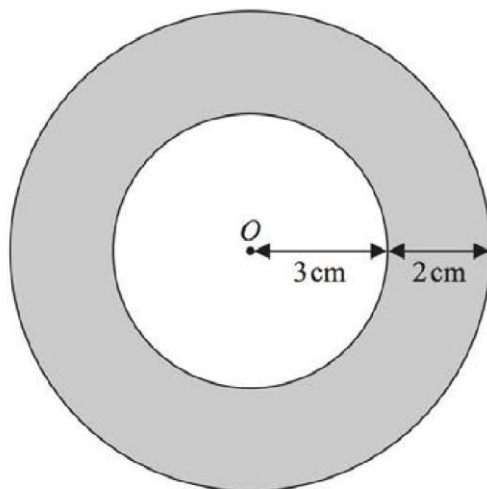


Diagram **NOT**
accurately drawn

The circles have the same centre O .

The radius of the inner circle is 3 cm.

The width of the shaded region between the inner circle and outer circle is 2 cm.

Work out the area of the shaded region.

Give your answer correct to 3 significant figures.

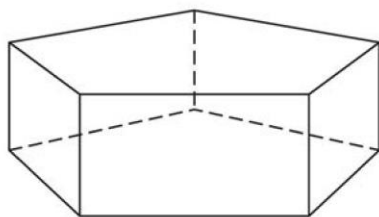
.....cm²

3



5 - (4MA0-W 2016-Paper 2FR-Q10) - *MENSURATION*

The diagram shows a solid prism.



(a) How many edges has the prism?

.....
(1)

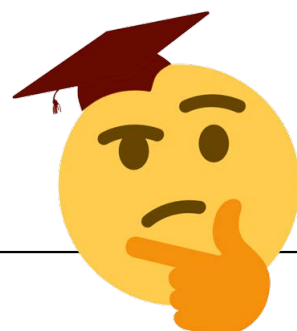
(b) How many vertices has the prism?

.....
(1)

(c) How many faces has the prism?

.....
(1)

(Total for Question is 3 marks)



6 - (4MA0-W 2016-Paper 2FR-Q14) - MENSURATION

The diagram shows a cuboid.

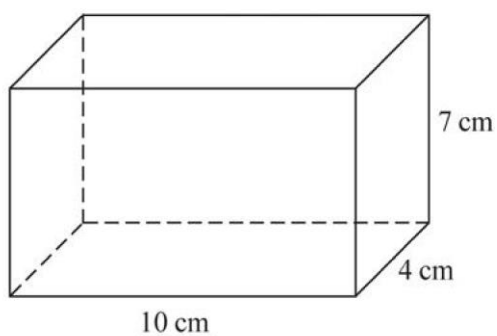


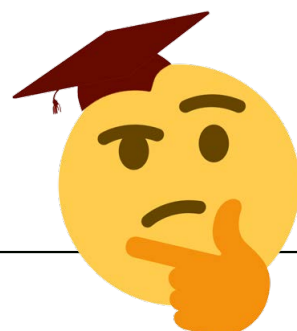
Diagram **NOT**
accurately drawn

The cuboid has length 10 cm, width 4 cm and height 7 cm.

Work out the volume of the cuboid.

..... cm^3

(Total for Question is 2 marks)



7 - (4MA0-W 2016-Paper 2FR-Q18) - MENSURATION

Here are a rectangle and a square.

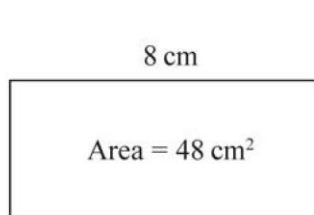


Diagram **NOT**
accurately drawn

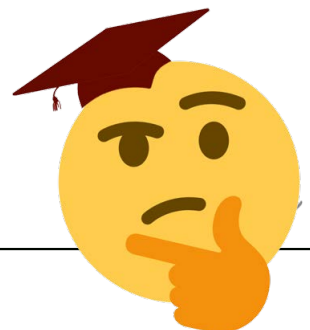
The rectangle has length 8 cm and area 48 cm²

The perimeter of the square is the same as the perimeter of the rectangle.

Calculate the area of the square.

..... cm²

(Total for Question is 4 marks)



8 - (4MA0-S 2017-Paper 2FR-Q9) - MENSURATION

The diagram shows a shape $ABCDE$ made from a square $BCDE$ and an equilateral triangle ABE .

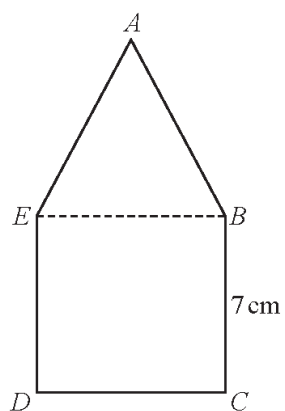


Diagram **NOT**
accurately drawn

$BCDE$ is a square of side 7 cm.

Work out the perimeter of shape $ABCDE$.

..... cm

2 marks)



9 - (4MA0-S 2017-Paper 2FR-Q16) - *MENSURATION*

The diagram shows a cuboid and a triangular prism.

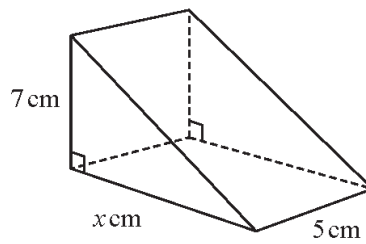
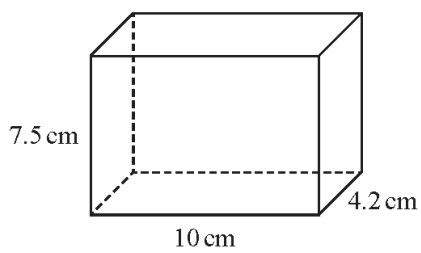
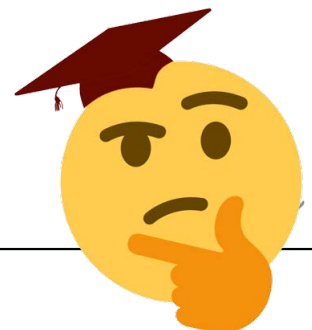


Diagram **NOT**
accurately drawn

The volume of the cuboid is equal to the volume of the triangular prism.

Work out the value of x .

.....
4 marks)



10 - (4MA0-W 2017-Paper 2FR-Q14) - MENSURATION

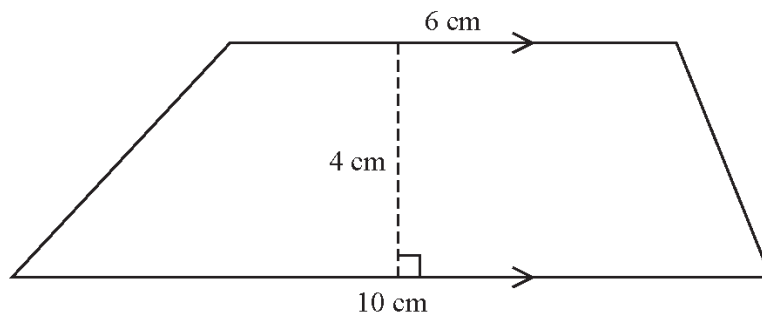
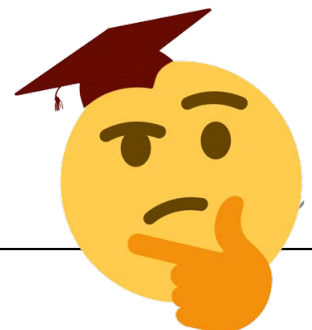


Diagram **NOT**
accurately drawn

Work out the area of this trapezium.

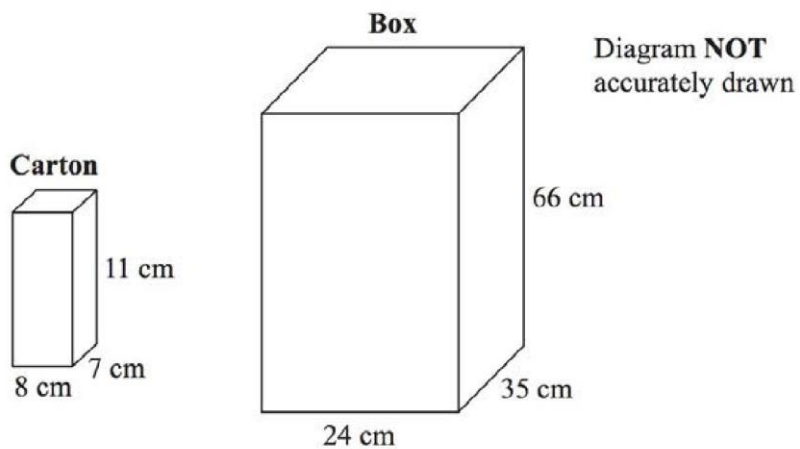
..... cm²

(Total for Question is 2 marks)



11 - (4MA0-W 2017-Paper 2FR-Q15) - MENSURATION, GEOMETRY

Cartons are packed into a box.



Each carton is 8 cm by 7 cm by 11 cm.
The box is 24 cm by 35 cm by 66 cm.

The box is completely filled with cartons.

Work out the number of cartons in the box.

(Total for Question is 3 marks)



12 - (4MA0-W 2017-Paper 2FR-Q19) - *MENSURATION*

The diagram shows a rectangle and a circle.

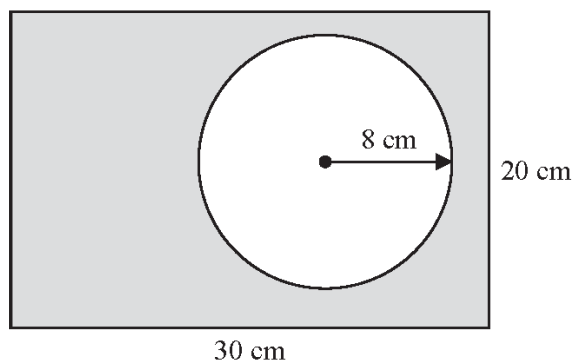


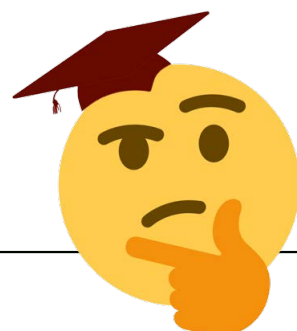
Diagram **NOT**
accurately drawn

The rectangle has length 30 cm and width 20 cm.
The circle has radius 8 cm.

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

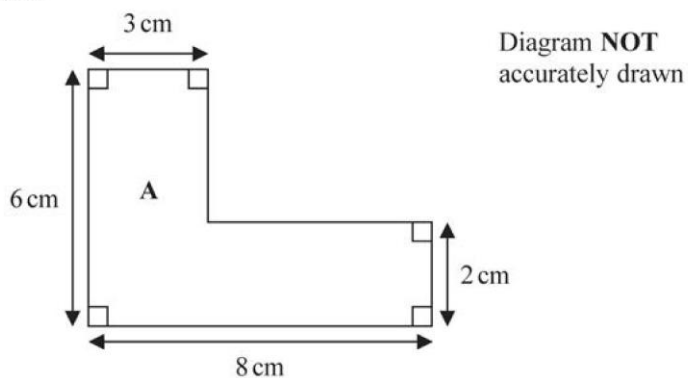
..... cm²

(Total for Question is 4 marks)



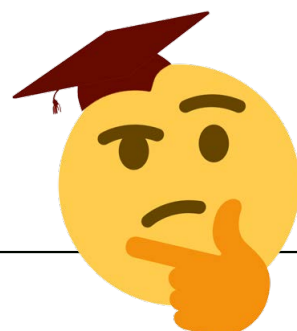
13 - (4MA0-W 2018-Paper 2FR-Q18) - MENSURATION

The diagram shows shape A.

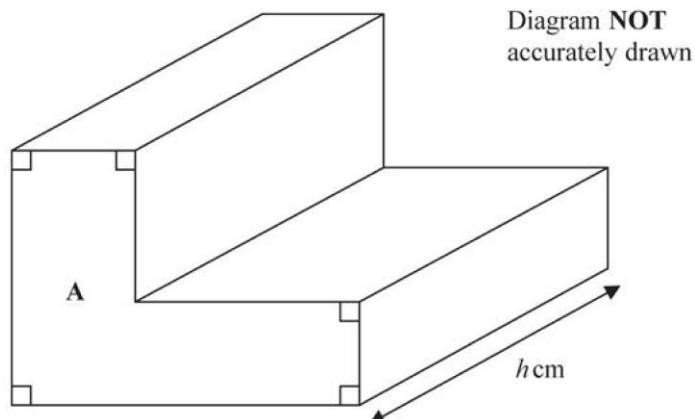


- (a) Work out the area of shape A.

.....cm²
(3)



Here is a prism with shape **A** as its cross section.



The volume of the prism is 350 cm^3
The length of the prism is $h \text{ cm}$.

(b) Work out the value of h .

(2)

14 - (4MA0-W 2019-Paper 2FR-Q11) - MENSURATION

Here is a rectangle.

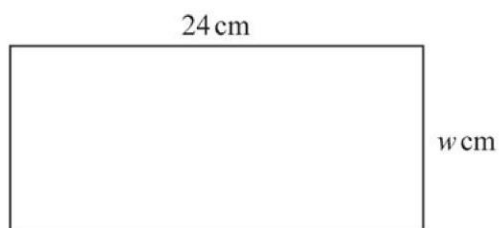


Diagram **NOT** accurately drawn

The area of the rectangle is 432 cm^2

Work out the value of w .

$w =$



15 - (4MA0-W 2019-Paper 2FR-Q17) - *MENSURATION*

The diagram shows a square and a circle.

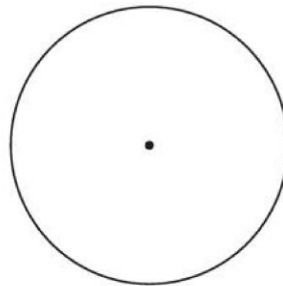
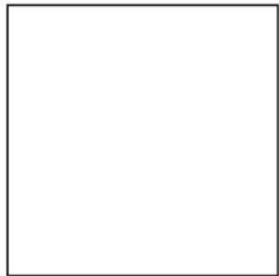


Diagram **NOT**
accurately drawn

The square has area 400 cm^2

The diameter of the circle is equal to the length of a side of the square.

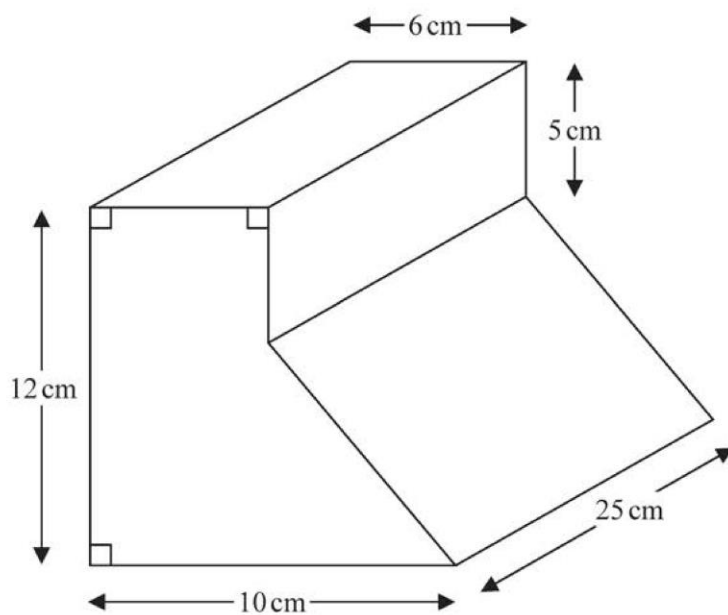
Work out the circumference of the circle.

Give your answer correct to 1 decimal place.

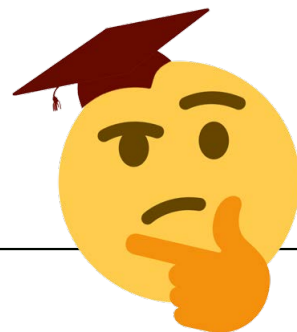


16 - (4MA0-W 2019-Paper 2FR-Q23) - MENSURATION

Here is a prism.

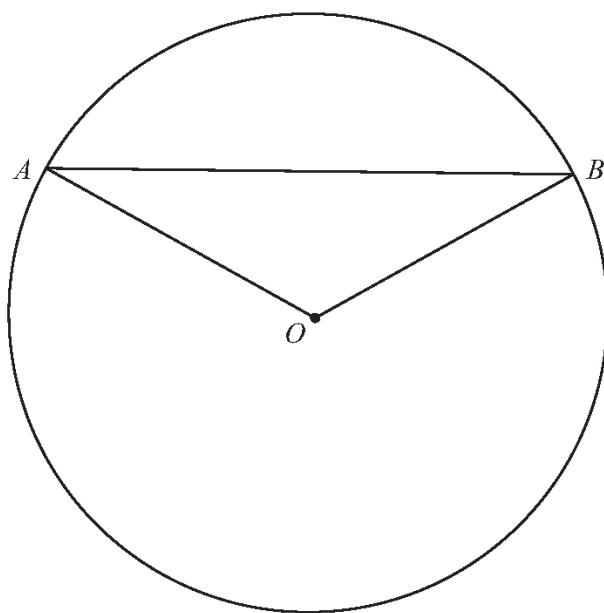


Work out the volume of this prism.



1 - (4MA0-S 2015-Paper 2FR-Q3) - GEOMETRY

The diagram shows a circle with centre O .
The points A and B lie on the circle.



- (a) At the point B , draw a tangent to the circle.

(1)

- (b) Mark on the diagram a reflex angle.
Label this angle R .

(1)

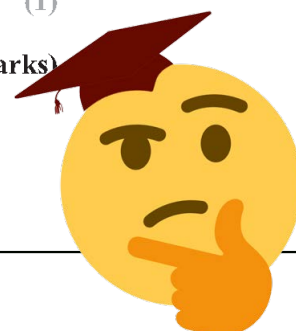
- (c) Write down the mathematical name of the line OB .

.....
(1)

- (d) Shade a segment of the circle.

(1)

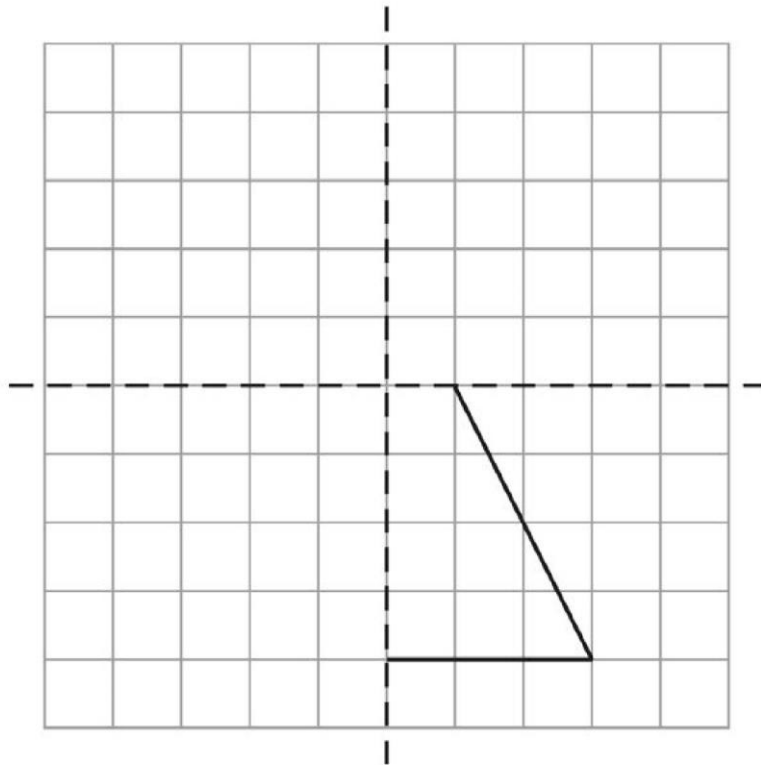
(Total for Question 1 is 4 marks)



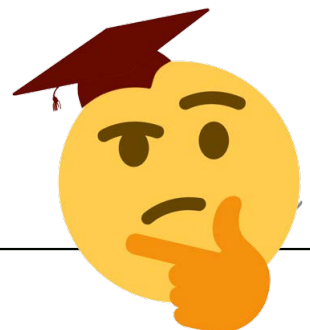
2 - (4MA0-S 2015-Paper 2FR-Q10) - *GEOMETRY*

A shape has exactly 2 lines of symmetry.
The diagram shows the lines of symmetry and part of the shape.

Draw the complete shape.



(Total for Question is 2 marks)



3 - (4MA0-S 2015-Paper 2FR-Q13) - GEOMETRY

PQR is a triangle.

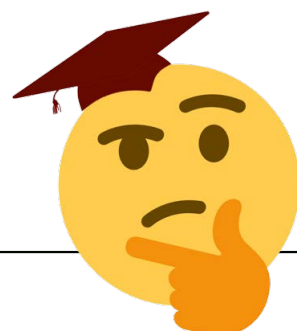
$PQ = 6 \text{ cm}$ and $QR = 7.3 \text{ cm}$

Angle $QPR = 60^\circ$

Draw accurately the triangle PQR with PQ as its base.

P ————— Q

(Total for Question is 2 marks)



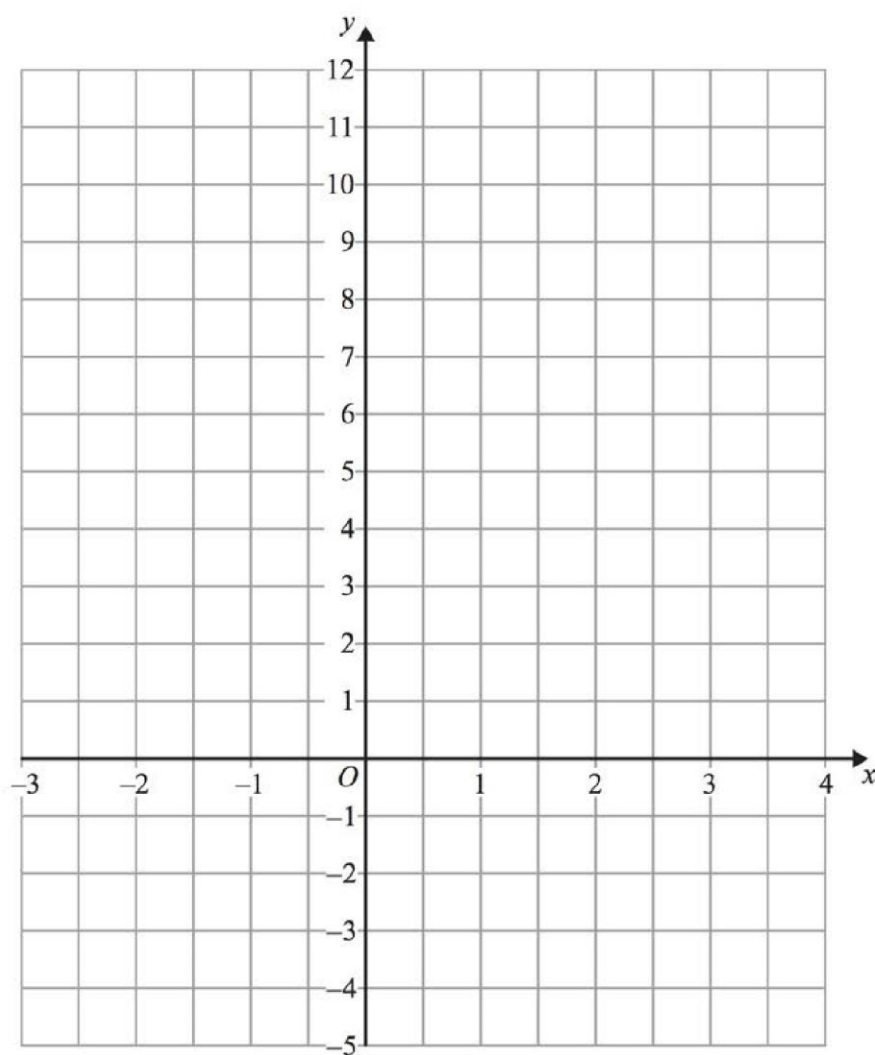
4 - (4MA0-S 2015-Paper 2FR-Q18) - GEOMETRY

(a) On the grid, draw the graph of

(i) $x = 2$

(ii) $y = 3$

(iii) $y = 3x + 2$ for values of x from -2 to 3



(5)

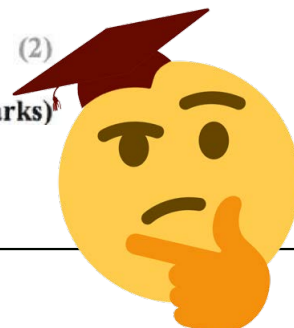
(b) Mark with a cross (×) a point on the grid that satisfies both the inequalities

$$x > 2 \text{ and } y > 3x + 2$$

Label this point P .

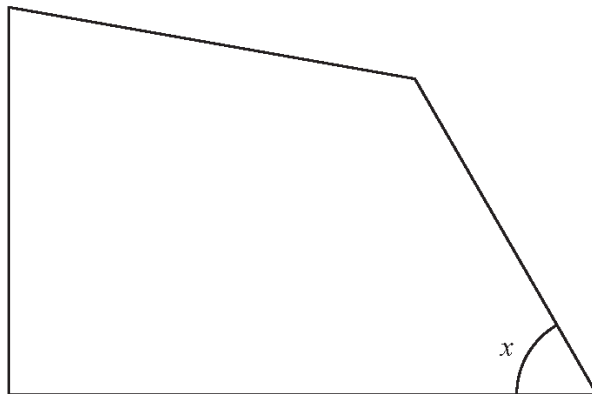
(2)

(Total for Question is 7 marks)



5 - (4MA0-W 2015-Paper 2FR-Q3) - *GEOMETRY*

Here is a shape.



- (a) (i) What type of angle is the angle marked x ?

.....

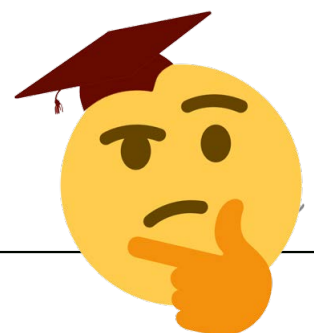
- (ii) Write down the size of the angle marked x .

.....
(2)

- (b) On the shape, mark the right angle.
Label your angle R.

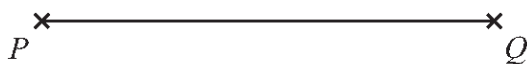
(1)

(Total for Question is 3 marks)



6 - (4MA0-W 2015-Paper 2FR-Q4) - *GEOMETRY*

Draw a circle with a radius of 3 cm.
Use the line PQ as a diameter of the circle.



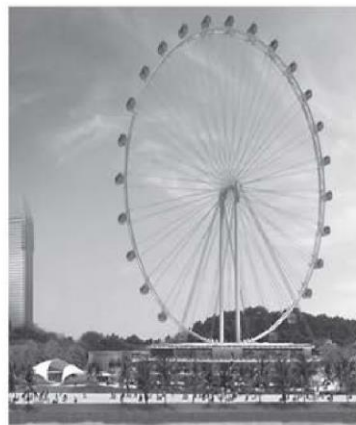
(Total for Question is 2 marks)



7 - (4MA0-W 2015-Paper 2FR-Q18) - *GEOMETRY*

The wheel of the Singapore Flyer is a circle with a diameter of 150 metres.

- (a) Calculate the circumference of the wheel.
Give your answer correct to the nearest metre.

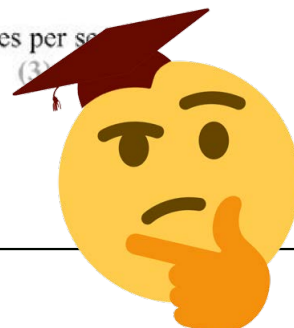


..... metres
(2)

The wheel takes 30 minutes to rotate once.

- (b) Work out the average speed of a point on the circumference of the wheel as it rotates once.
Give your answer in metres per second correct to 3 significant figures.

..... metres per second
(3)



The diagram shows a giant wheel above horizontal ground.

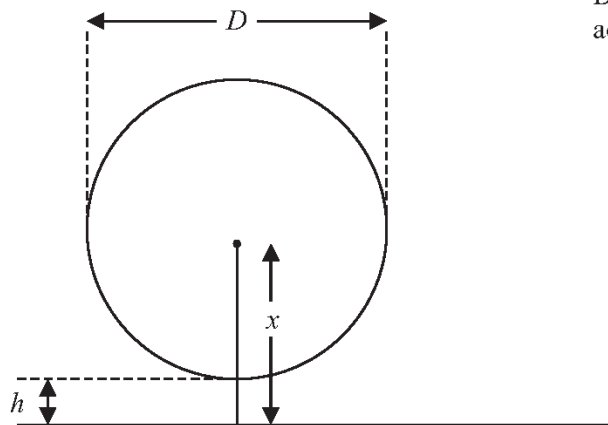


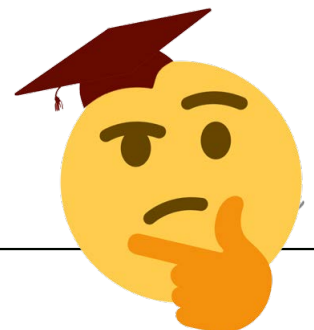
Diagram **NOT**
accurately drawn

The wheel is a circle of diameter D metres.
The lowest point of the wheel is h metres above the ground.
The centre of the wheel is x metres above the ground.

(c) Express h in terms of D and x

.....
(2)

(Total for Question is 7 marks)



8 - (4MA0-W 2015-Paper 2FR-Q19) - GEOMETRY

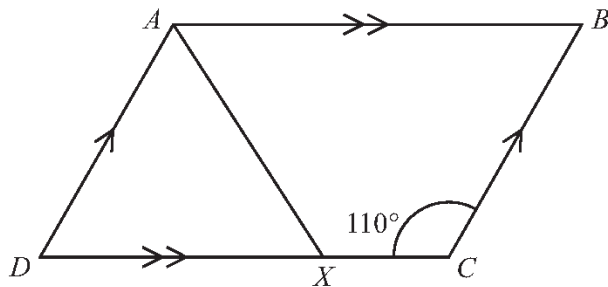


Diagram **NOT**
accurately drawn

$ABCD$ is a parallelogram.

Angle $DCB = 110^\circ$

X is the point on DC such that AX bisects the angle DAB .

Calculate the size of angle AXC .

.....
o

(Total for Question is 4 marks)



9 - (4MA0-W 2015-Paper 2FR-Q23) - GEOMETRY

Here is a trapezium $ABCD$.

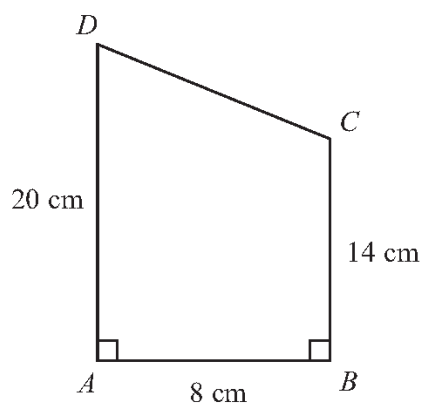


Diagram **NOT**
accurately drawn

Angle $DAB = \text{angle } ABC = 90^\circ$

$AD = 20 \text{ cm}$

$AB = 8 \text{ cm}$

$BC = 14 \text{ cm}$

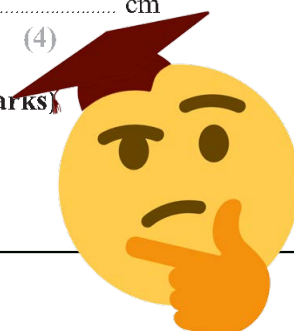
(a) Calculate the area of the trapezium $ABCD$.

..... cm^2
(2)

(b) Calculate the length of CD .

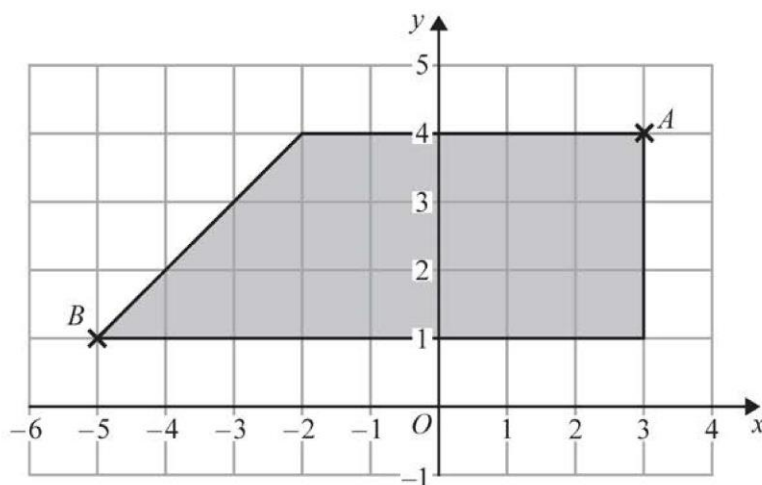
..... cm
(4)

(Total for Question is 6 marks)



10 - (4MA0-S 2016-Paper 2FR-Q1) - *GEOMETRY*

The diagram shows a shaded shape drawn on a centimetre grid.



(a) (i) Write down the coordinates of A .

(.....,.....)

(ii) Write down the coordinates of B .

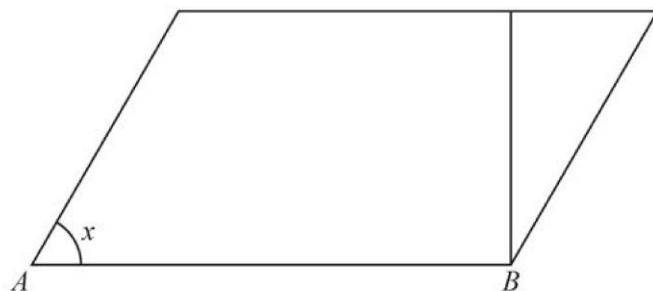
(.....,.....)
(2)

(b) Find the area of the shaded shape.

..... cm^2
(2)



11 - (4MA0-S 2016-Paper 2FR-Q3) - GEOMETRY



(a) On the diagram, mark a right angle with the letter R.

(1)

(b) Measure the size of the angle marked x .

.....
(1)

(c) Measure the length of the line AB .
State the units of your answer.

.....
(2)



12 - (4MA0-S 2016-Paper 2FR-Q10) - GEOMETRY

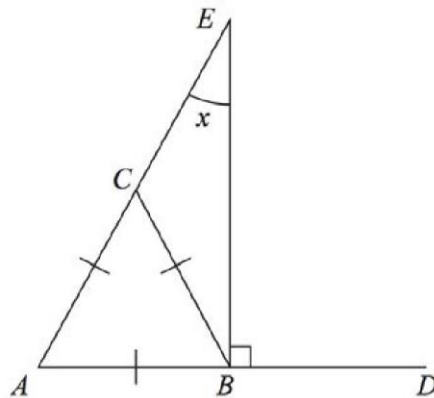
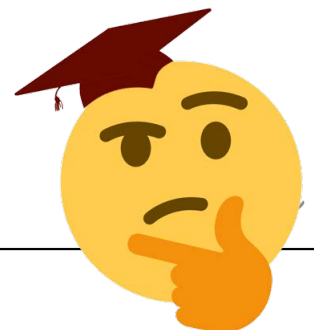


Diagram **NOT**
accurately drawn

ABC is an equilateral triangle.
 ABD and ACE are straight lines.
Angle $EBD = 90^\circ$

Work out the size of angle x .

.....
3 marks



13 - (4MA0-S 2016-Paper 2FR-Q19) - GEOMETRY

Here is a kite $ABCD$.

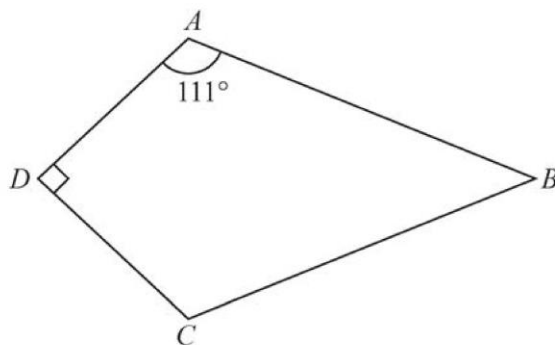


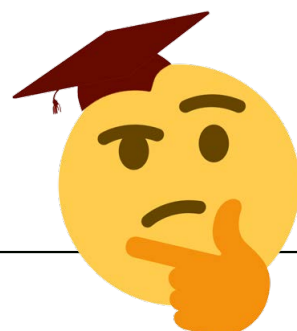
Diagram **NOT**
accurately drawn

Angle $DAB = 111^\circ$

Angle $ADC = 90^\circ$

(a) Work out the size of angle ABC .

.....
(2)



Two of these kites are arranged so that a shorter side of one of the kites is placed on top of a shorter side of the other kite, as shown in the diagram below.

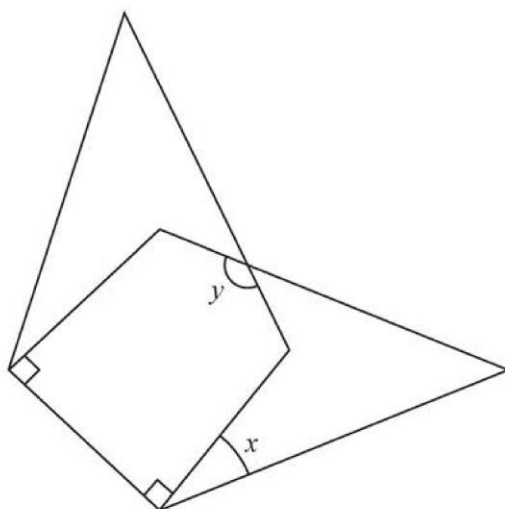


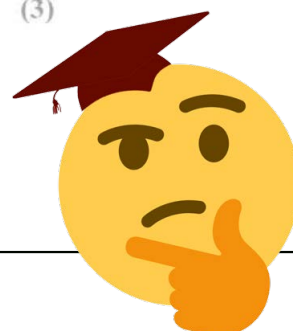
Diagram **NOT**
accurately drawn

(b) Work out the size of angle x .

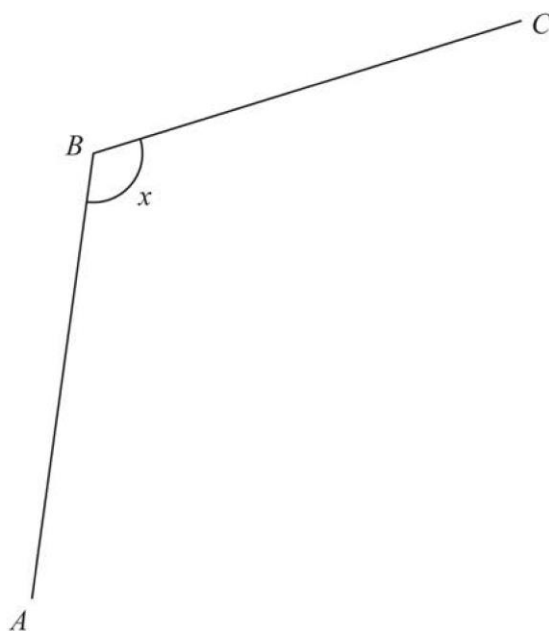
.....
(2)

(c) Work out the size of angle y .

.....
(3)



14 - (4MA0-W 2016-Paper 2FR-Q4) - GEOMETRY



- (a) Measure the length of the line BC .
Give your answer in millimetres.

..... mm
(1)

- (b) Measure the size of angle x .

.....
(1)

acute	right	obtuse	reflex
-------	-------	--------	--------

- (c) Choose the word from the box that best describes angle x in the diagram.

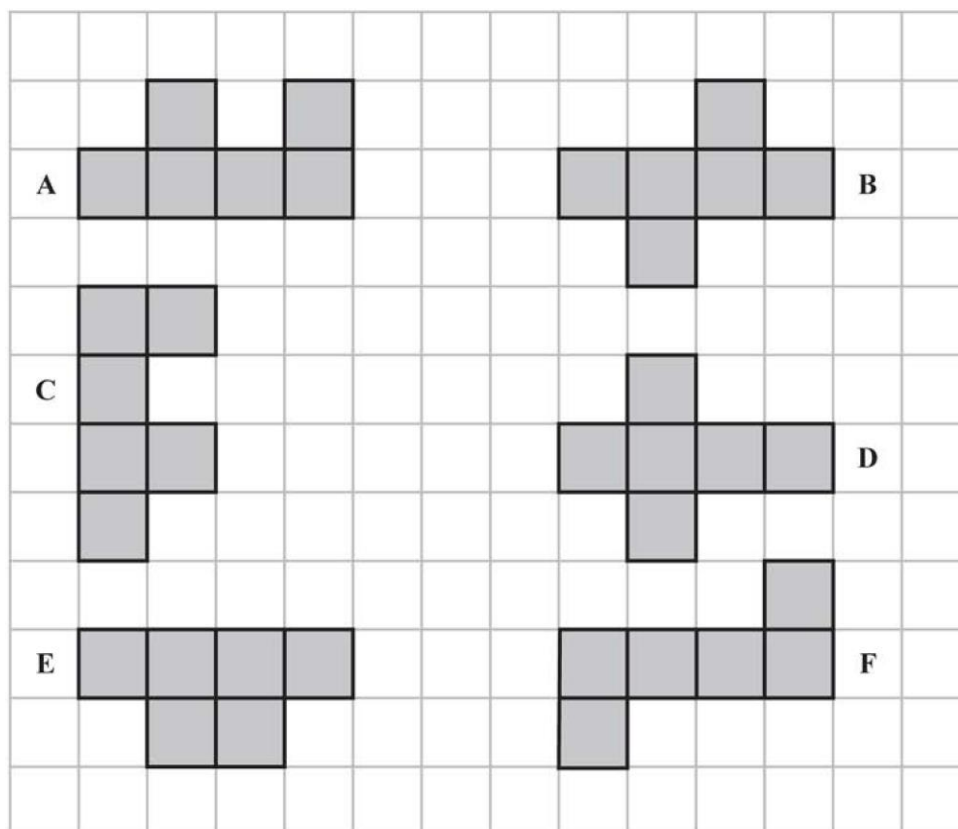
.....
(1)

(Total for Question is 3 marks)



15 - (4MA0-W 2016-Paper 2FR-Q6) - GEOMETRY

Here are six shapes made from centimetre squares.



(a) Write down the letter of a shape with rotational symmetry of order 2

.....
(1)

(b) How many lines of symmetry has shape **D**?

.....
(1)

(c) Work out the perimeter of shape **E**.

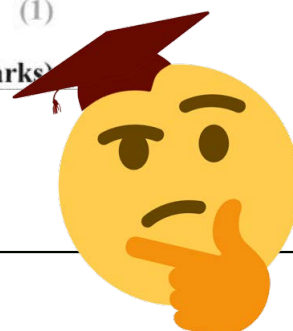
..... cm
(1)

Two of the shapes are congruent.

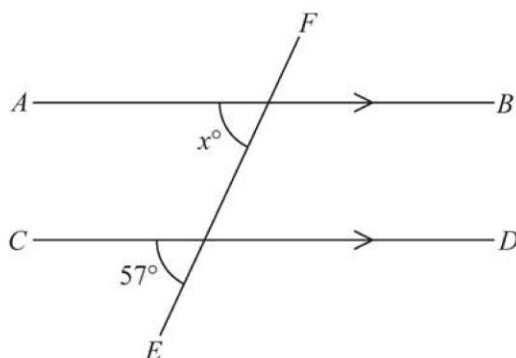
(d) Write down the letters of these two shapes.

..... and
(1)

(Total for Question 15 is 4 marks)



16 - (4MA0-W 2016-Paper 2FR-Q23) - GEOMETRY

Diagram **NOT**
accurately drawn

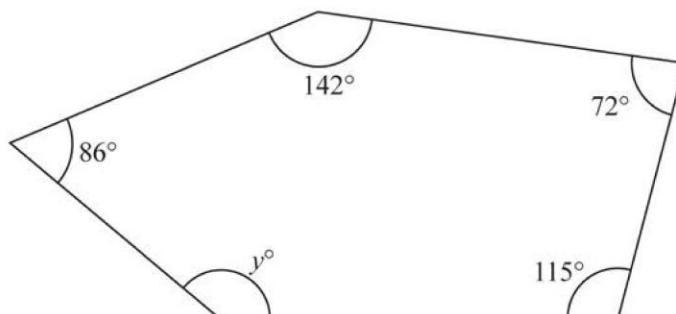
AB is parallel to CD
 EF is a straight line.

(a) (i) Find the value of x $x = \dots\dots\dots$

(ii) Give a reason for your answer.

(2)

Here is a pentagon.

Diagram **NOT**
accurately drawn(b) Work out the value of y . $y = \dots\dots\dots$

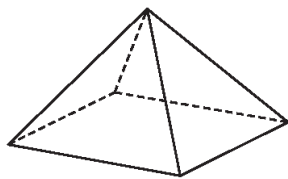
(3)

(Total for Question is 5 marks)



17 - (4MA0-S 2017-Paper 2FR-Q6) - *GEOMETRY*

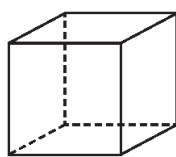
The diagram shows a square-based pyramid.



(a) How many edges has a square-based pyramid?

.....
(1)

The diagram shows a cube.



(b) How many faces has a cube?

.....
(1)

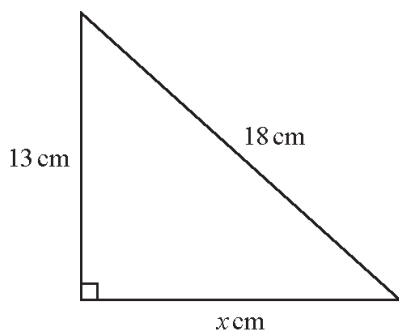
18 - (4MA0-S 2017-Paper 2FR-Q25) - *GEOMETRY*

Diagram **NOT**
accurately drawn

Work out the value of x .

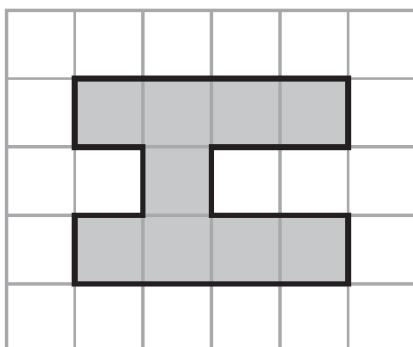
Give your answer correct to 3 significant figures.

.....
3 marks)



19 - (4MA0-W 2017-Paper 2FR-Q3) - GEOMETRY

The diagram shows a shape drawn on a centimetre grid.



(a) (i) Find the area of the shape.

..... cm^2

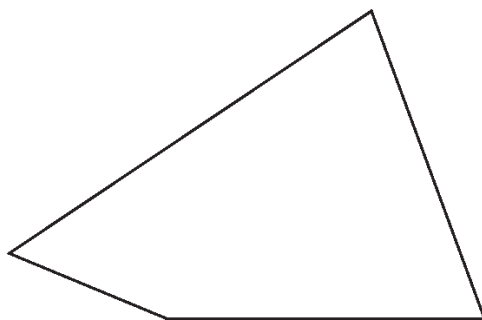
(ii) Find the perimeter of the shape.

..... cm

(iii) On the grid, draw the line of symmetry of the shape.

(3)

Here is a different shape.



(b) On this shape, mark an obtuse angle.
Label your angle O

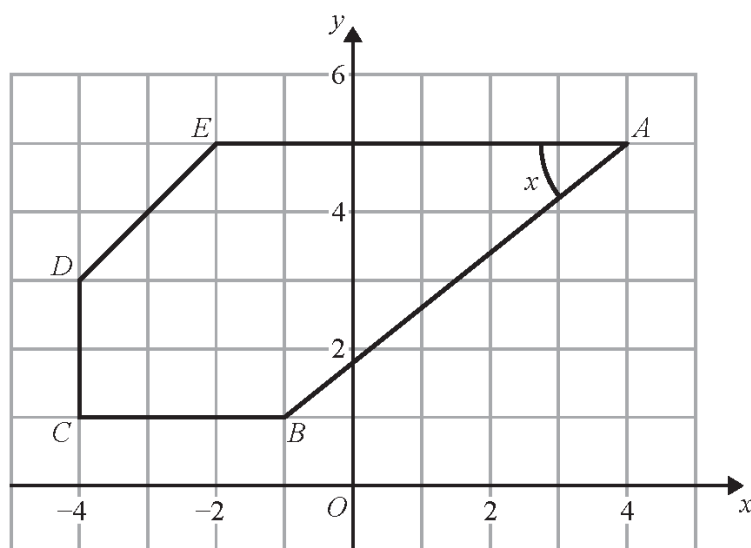
(1)

(Total for Question is 4 marks)



20 - (4MA0-W 2017-Paper 2FR-Q5) - GEOMETRY

The diagram shows a 5-sided polygon $ABCDE$ drawn on a centimetre grid.



(a) Write down the coordinates of the point A .

(.....,)
(1)

(b) Write down the coordinates of the point C .

(.....,)
(1)

(c) Write down the mathematical name for a 5-sided polygon.

.....
(1)

(d) Measure the length of the line AB .

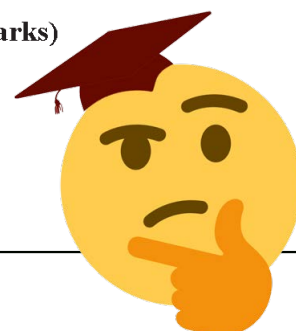
Give your answer in centimetres to 1 decimal place.

..... cm
(1)

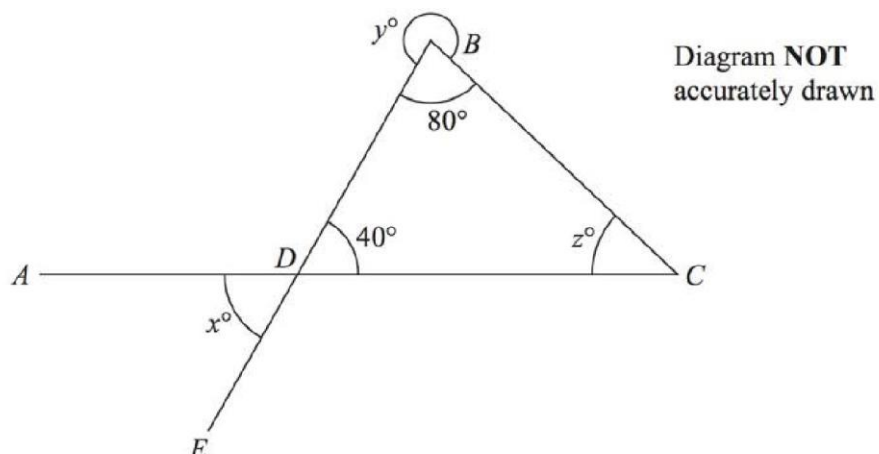
(e) Measure the size of the angle marked x .

.....
(1)

(Total for Question is 5 marks)



21 - (4MA0-W 2017-Paper 2FR-Q9) - GEOMETRY



ADC is a straight line.

BDE is a straight line.

Angle $DBC = 80^\circ$

Angle $BDC = 40^\circ$

(a) Write down the value of x .

$x = \dots\dots\dots$
(1)

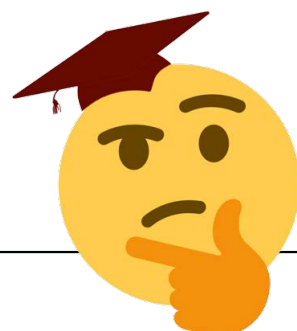
(b) Work out the value of y .

$y = \dots\dots\dots$
(1)

(c) Work out the value of z .

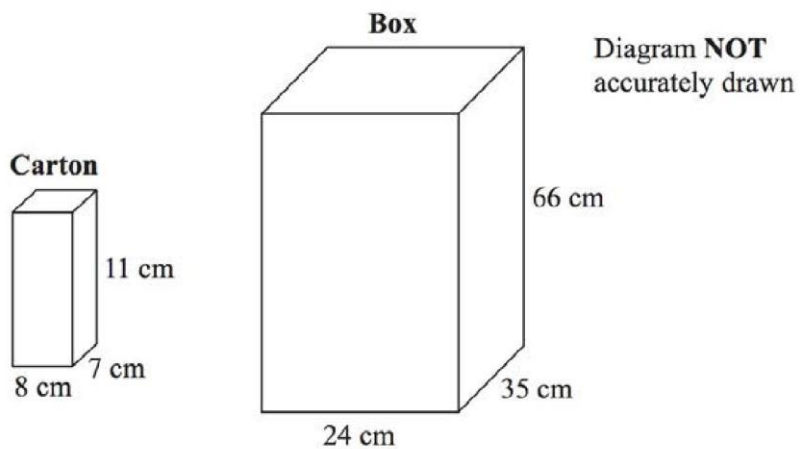
$z = \dots\dots\dots$
(2)

(Total for Question is 4 marks)



22 - (4MA0-W 2017-Paper 2FR-Q15) - MENSURATION, GEOMETRY

Cartons are packed into a box.



Each carton is 8 cm by 7 cm by 11 cm.
The box is 24 cm by 35 cm by 66 cm.

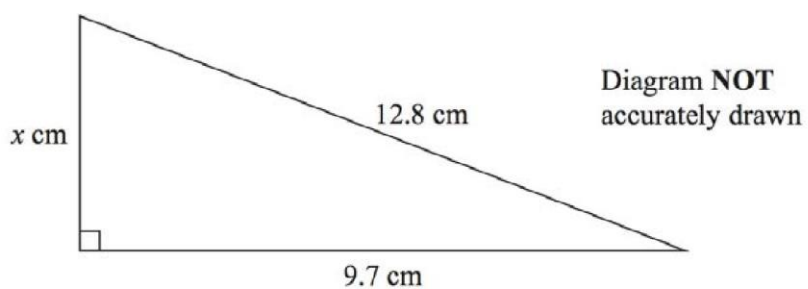
The box is completely filled with cartons.

Work out the number of cartons in the box.

(Total for Question is 3 marks)



23 - (4MA0-W 2017-Paper 2FR-Q21) - GEOMETRY



Work out the value of x .
Give your answer correct to 3 significant figures.

(Total for Question is 3 marks)



24 - (4MA0-W 2017-Paper 2FR-Q23) - GEOMETRY

The diagram shows a parallelogram $ABCD$.

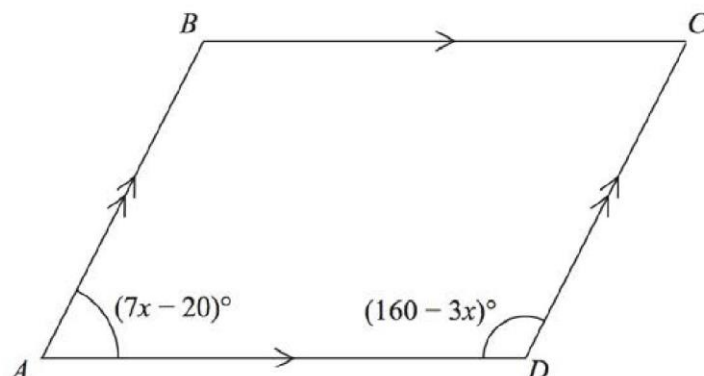


Diagram **NOT**
accurately drawn

Angle $BAD = (7x - 20)^\circ$

Angle $ADC = (160 - 3x)^\circ$

Work out the value of x .

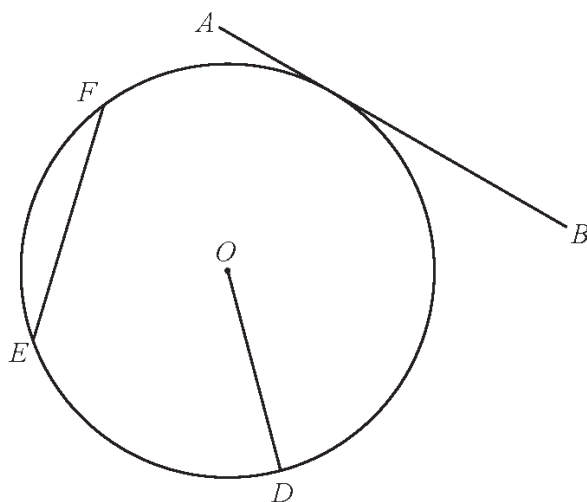
Show clear algebraic working.

$x =$

(Total for Question is 3 marks)



25 - (4MA0-S 2018-Paper 2FR-Q3) - GEOMETRY



The diagram shows a circle, centre O .
 D , E and F are points on the circle.
The line AB touches the circle.

Write down the mathematical name for the line

(i) AB

.....

(ii) OD

.....

(iii) EF

.....



26 - (4MA0-S 2018-Paper 2FR-Q12) - GEOMETRY

Here is a trapezium.

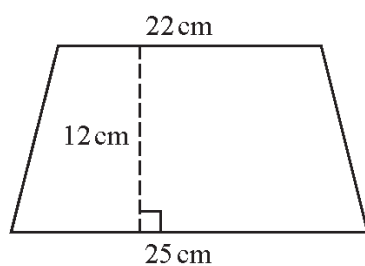


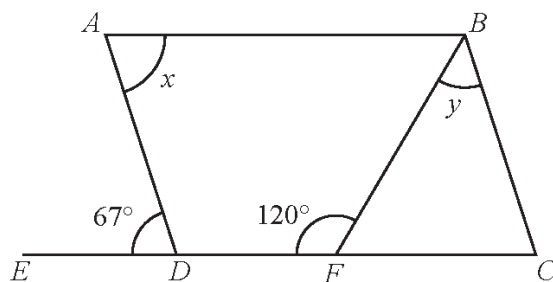
Diagram **NOT**
accurately drawn

Work out the area of the trapezium.

.....cm²



27 - (4MA0-S 2018-Paper 2FR-Q17) - GEOMETRY

Diagram **NOT**
accurately drawn

$ABCD$ is a parallelogram.
 $EDFC$ is a straight line.

(a) (i) Write down the size of angle x .

.....
○

(ii) Give a reason for your answer.

.....
(2)

(b) Work out the size of angle y .

.....
○
(2)



28 - (4MA0-W 2018-Paper 2FR-Q3) - GEOMETRY

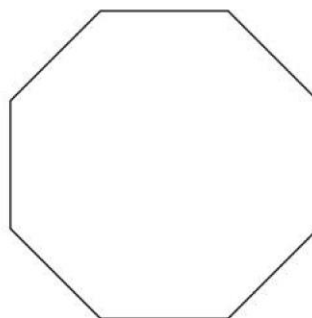
Here are three shapes.



A



B



C

Shape **A** is a triangle with 2 equal sides.

(a) (i) What type of triangle is shape **A**?

(ii) On this triangle, draw its line of symmetry.

.....
(2)

Shape **B** is a rectangle.

(b) Write down the order of rotational symmetry of shape **B**.

.....
(1)

Shape **C** is a regular polygon with sides of length 2 cm.

(c) (i) Write down the name of shape **C**.

.....
(1)

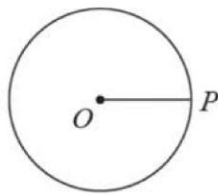
(ii) Find the perimeter of shape **C**.

.....cm
(2)



29 - (4MA0-W 2019-Paper 2FR-Q4) - GEOMETRY

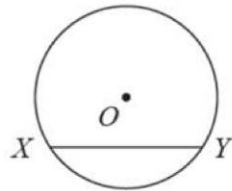
P is a point on a circle, centre O .



(a) Write down the mathematical name of the line OP .

(1)

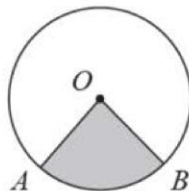
X and Y are points on a circle, centre O .



(b) Write down the mathematical name of the line XY .

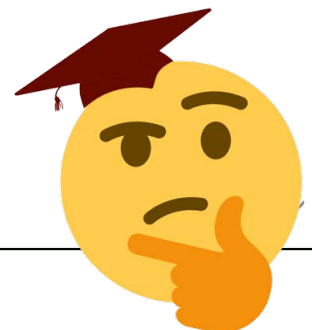
(1)

A and B are points on a circle, centre O .

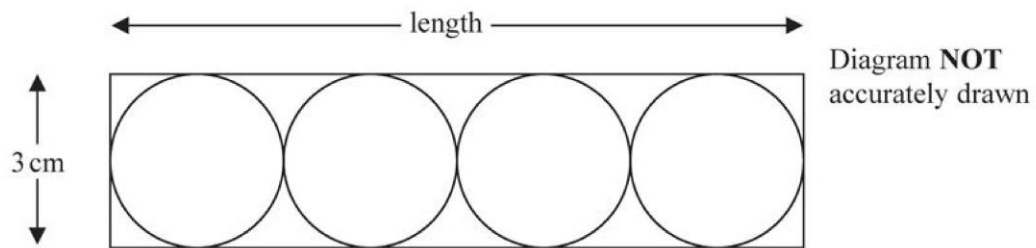


(c) Write down the mathematical name of the shaded region.

(1)



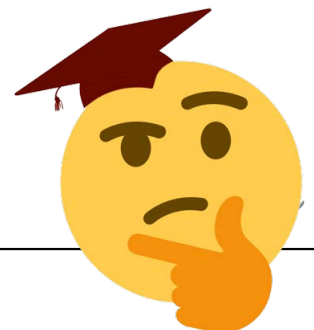
The diagram shows four identical circles and a rectangle.
The circles fit exactly in the rectangle without overlapping as shown in the diagram.



The width of the rectangle is 3 cm.

(d) Work out the length of the rectangle.

(1) cm



30 - (4MA0-W 2019-Paper 2FR-Q7) - GEOMETRY

Here is a sketch of triangle PQR .

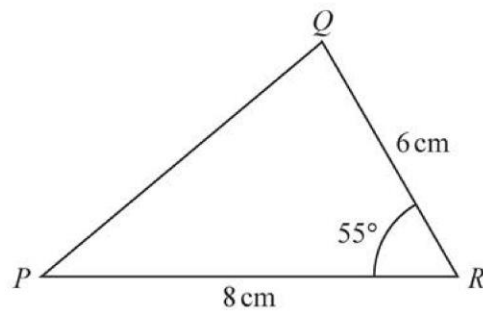
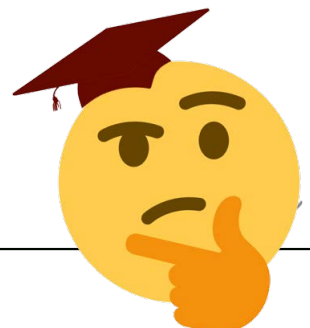


Diagram **NOT**
accurately drawn

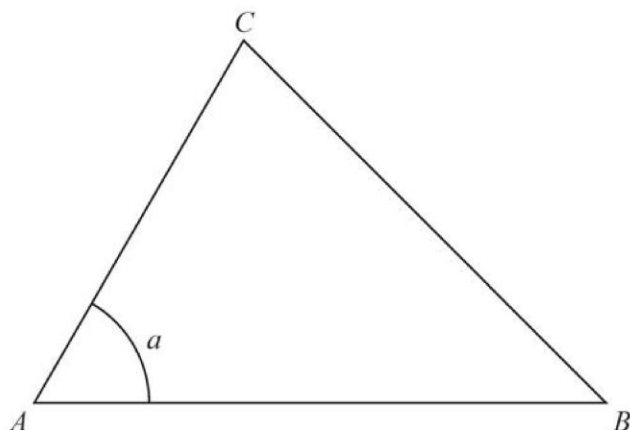
- (a) Make an accurate drawing of triangle PQR .
The line PR has already been drawn for you.



(2)



Triangle ABC has been accurately drawn.



(b) Measure the size of angle a .

(1)

D is the point on AB such that CD is perpendicular to AB .

(c) On the accurate diagram above, mark the position of point D with a cross (X)
Label the point D .

(1)



31 - (4MA0-W 2019-Paper 2FR-Q12) - GEOMETRY

Four congruent squares are used to form a shape.

Two squares meet at each vertex of the shape as shown in the diagram.

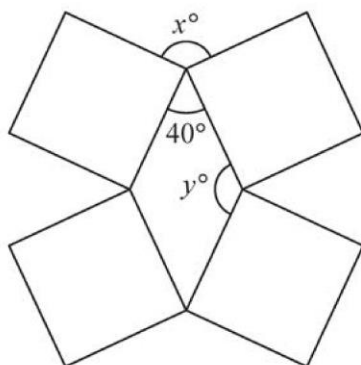


Diagram **NOT**
accurately drawn

(a) Work out the value of x .

$$x =$$

(2)

(b) Work out the value of y .

$$y =$$

(1)



32 - (4MA0-W 2019-Paper 2FR-Q21) - GEOMETRY

Here is a right-angled triangle.

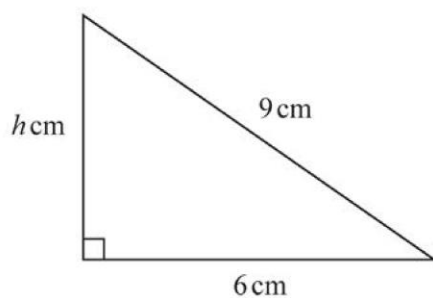


Diagram **NOT**
accurately drawn

Calculate the value of h .

Give your answer correct to 2 decimal places.

$h =$



1 - (4MA0-S 2015-Paper 2FR-Q20) - TRIGONOMETRY

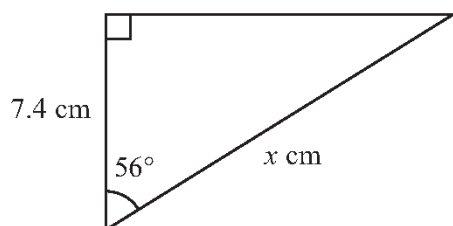


Diagram **NOT**
accurately drawn

Work out the value of x .
Give your answer correct to 3 significant figures.

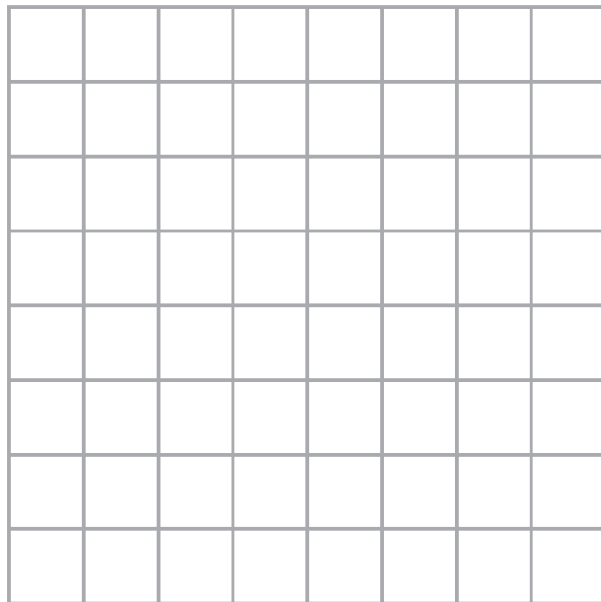
$x =$

(Total for Question is 3 marks)



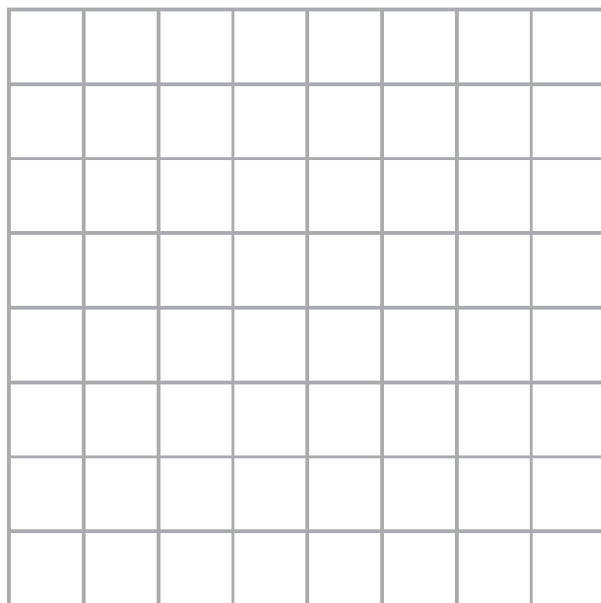
2 - (4MA0-W 2015-Paper 2FR-Q12) - TRIGONOMETRY

(a) On the centimetre grid, draw a rectangle with an area of 8 cm^2



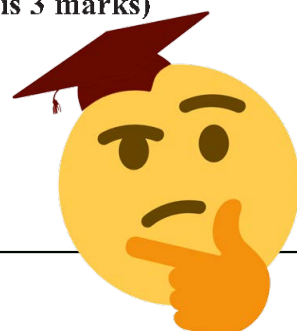
(1)

(b) On the centimetre grid, draw an isosceles triangle with an area of 8 cm^2



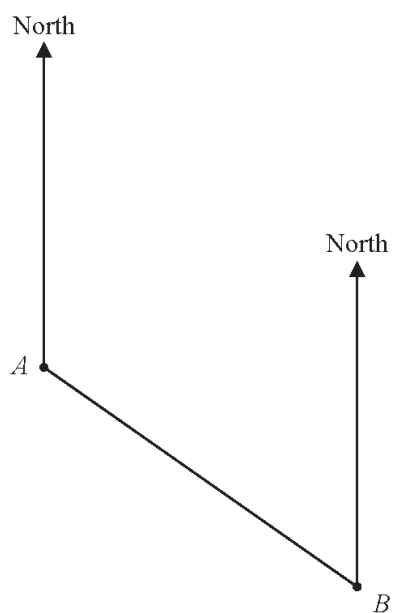
(2)

(Total for Question is 3 marks)



3 - (4MA0-S 2017-Paper 2FR-Q10) - *TRIGONOMETRY*

The scale diagram shows the position of two ships, A and B .



Scale: 1 cm represents 1 km

- (a) Measure the bearing of B from A .

.....
(1)

Another ship C is on a bearing of 070° from B .
Ship C is 7 km from B .

- (b) Mark the position of ship C with a cross ($\times$).

(2)



4 - (4MA0-W 2017-Paper 2FR-Q24) - NUMBER, TRIGONOMETRY

The diagram shows the positions of two towns, A and B .

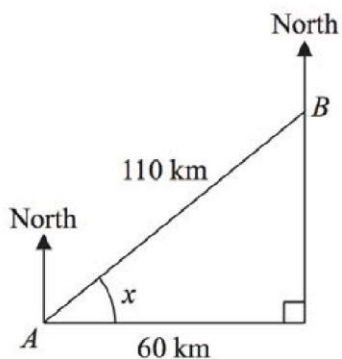


Diagram **NOT**
accurately drawn

The distance from A to B is 110 km.
 B is 60 km east of A .

- (a) Work out the size of angle x .
Give your answer correct to 1 decimal place.

.....
(3)

- (b) Work out the bearing of B from A .
Give your answer correct to the nearest degree.

.....
(2)

The distance from A to B is 110 km correct to 2 significant figures.

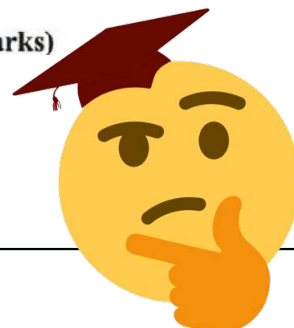
- (c) (i) Write down the lower bound for the distance from A to B .

..... km

- (ii) Write down the upper bound for the distance from A to B .

..... km
(2)

(Total for Question is 7 marks)



5 - (4MA0-S 2018-Paper 2FR-Q22) - TRIGONOMETRY

A , B and C are three cities.

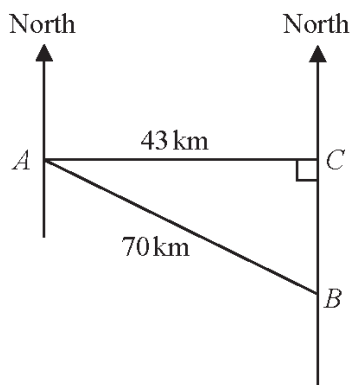


Diagram **NOT**
accurately drawn

City C is due east of city A and due north of city B .
City A is 43 km from city C and 70 km from city B .

Work out the bearing of city B from city A .
Give your answer correct to the nearest degree.

(Total for Question is 4 marks)



6 - (4MA0-W 2018-Paper 2FR-Q17) - TRIGONOMETRY

Here is a right-angled triangle.

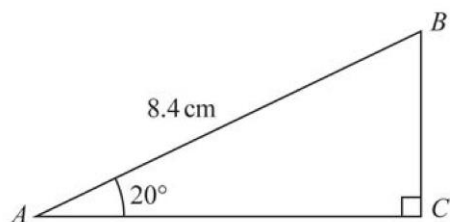


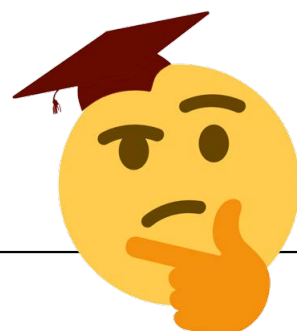
Diagram **NOT**
accurately drawn

Calculate the length of BC .

Give your answer correct to 3 significant figures.

.....cm

(Total for Question is 3 marks)



1 - (4MA0-S 2015-Paper 2FR-Q11) - SETS

$$S = \{c, h, i, n, a\}$$

$$V = \{i, t, a, l, y\}$$

List the elements of the set

(i) $S \cap V$

.....

(ii) $S \cup V$

.....

(Total for Question is 2 marks)



2 - (4MA0-W 2015-Paper 2FR-Q24) - SETS

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A = \{\text{even numbers}\}$$

$$B = \{\text{multiples of 3}\}$$

(a) List the members of set B .

.....
(1)

(b) Find $A \cup B$

.....
(1)

(c) Find $A \cap B$

.....
(1)

x is a member of $\mathcal{E}$

$$x \in B$$

$$x \notin A$$

(d) What are the possible values of x ?

.....
(2)

.....
(Total for Question is 5 marks)



3 - (4MA0-W 2016-Paper 2FR-Q25) - SETS

$$\mathcal{E} = \{\text{whole numbers}\}$$

$$A = \{\text{factors of } 100\}$$

$$B = \{\text{multiples of } 5\}$$

List the members of the set $A \cap B$

(Total for Question is 2 marks)

4 - (4MA0-S 2017-Paper 2FR-Q18) - SETS

$$\mathcal{E} = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$$

$$A = \{\text{multiples of } 5\}$$

$$B = \{\text{odd numbers}\}$$

(a) List the members of the set

(i) $A \cap B$

(ii) $A \cup B$

(2)

The set C has 6 members and $B \cap C = \emptyset$

(b) List the members of set C .

(2)



5 - (4MA0-W 2017-Paper 2FR-Q18) - SETS

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A = \{2, 3, 5, 7\}$$

$$B = \{1, 3, 5, 7, 9\}$$

List the members of the set

(i) $A \cap B$

.....

(ii) $A \cup B$

.....

(Total for Question is 2 marks)



6 - (4MA0-W 2019-Paper 2FR-Q25) - SETS

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A = \{1, 3, 5, 7, 9\}$$

$$B = \{\text{numbers greater than 6}\}$$

(a) List the members of the set $A \cup B$

(1)

$$C = \{3, 6, 9\}$$

(b) List the members of the set $A \cap C$

(1)

D is a set with 4 members.

$$5 \in D \text{ and } B \cap D = \emptyset$$

(c) List the members of one possible set D .

(2)



1 - (4MA0-S 2015-Paper 2FR-Q4) - STATISTICS

Ben throws a dice 20 times.
He records the score for each throw.
Here are his scores.

4 1 2 2 5 1 6 2 3 4
2 5 4 5 1 6 1 3 2 6

(a) Complete the frequency table for his scores.

Score	Tally	Frequency
1		
2		
3		
4		
5		
6		

(2)

(b) Write down the mode of his scores.

.....
(1)

(c) Find the range of his scores.

.....
(1)

Ben throws the dice again.

(d) Draw a circle around the word in the box that best describes the likelihood that his score will be 6

Impossible

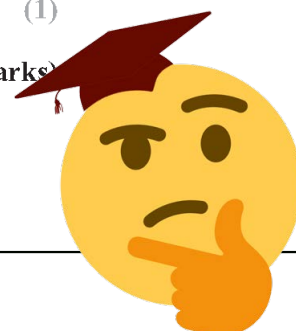
Unlikely

Likely

Certain

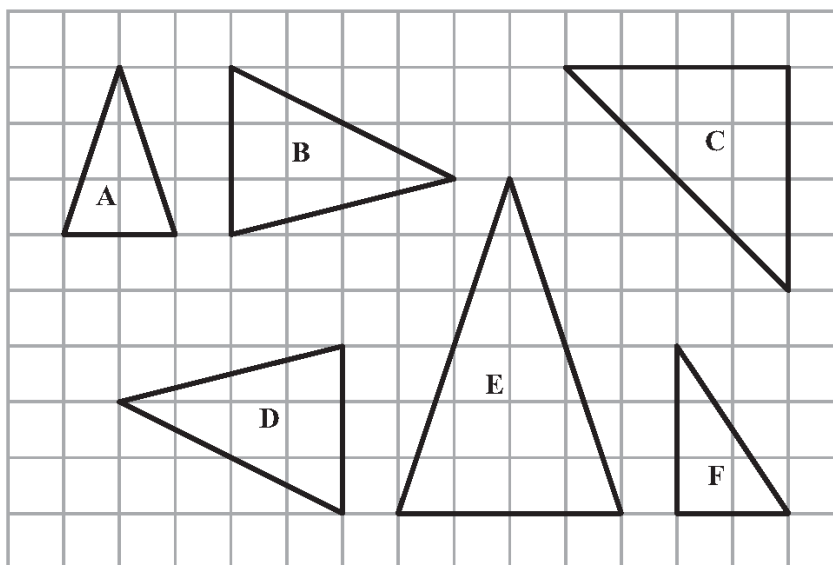
(1)

(Total for Question 1 is 5 marks)



2 - (4MA0-S 2015-Paper 2FR-Q5) - STATISTICS

The diagram shows six triangles on a square grid.



(a) Write down the mathematical name for triangle **A**.

.....
(1)

(b) Write down the letters of the two triangles that are similar but not congruent.

..... and
(1)

(c) Triangle **D** can be mapped onto triangle **B** by a rotation.

(i) On the grid, mark with a cross (×) the centre of this rotation.

(ii) Write down the angle of this rotation.

..... °
(2)

(Total for Question is 4 marks)



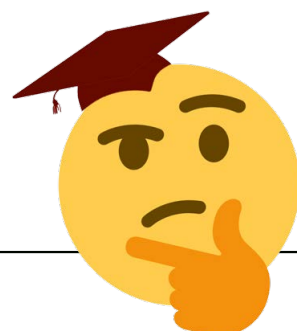
3 - (4MA0-S 2015-Paper 2FR-Q9) - *STATISTICS*

Here are six numbers.

8 3 1 7 6 5

Work out the mean of these numbers.

.....
(Total for Question is 2 marks)



4 - (4MA0-S 2015-Paper 2FR-Q17) - STATISTICS

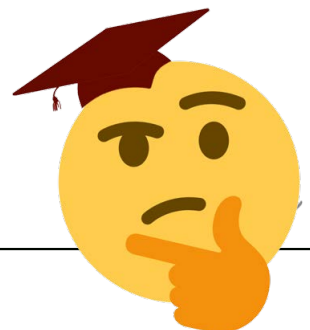
Jordan's school awards certificates for outstanding work.

The table shows information about the numbers of certificates awarded in Jordan's class during a term.

Number of certificates	Number of students
0	4
1	9
2	7
3	1
4	6
5	3

Work out the median number of certificates awarded.

.....
(Total for Question is 2 marks)



5 - (4MA0-W 2015-Paper 2FR-Q1) - STATISTICS

The pictogram gives information about the number of chocolate eggs sold from a shop on Monday, on Tuesday and on Wednesday.

Monday	 
Tuesday	 
Wednesday	  
Thursday	

 represents 8 chocolate eggs

(a) How many chocolate eggs were sold on Monday?

.....
(1)

(b) How many chocolate eggs were sold on Wednesday?

.....
(1)

10 more chocolate eggs were sold on Thursday than on Wednesday.

(c) Show this information on the pictogram.

(2)

(Total for Question is 4 marks)



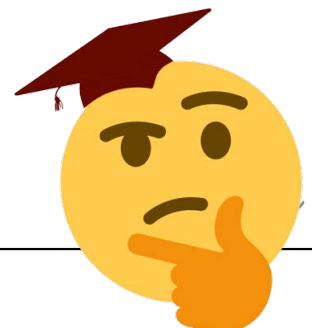
6 - (4MA0-W 2015-Paper 2FR-Q22) - STATISTICS

The table gives information about the number of vehicles passing a point on a road in each of 70 intervals of equal length.

Number of vehicles	Frequency
1 to 5	8
6 to 10	10
11 to 15	18
16 to 20	20
21 to 25	10
26 to 30	4

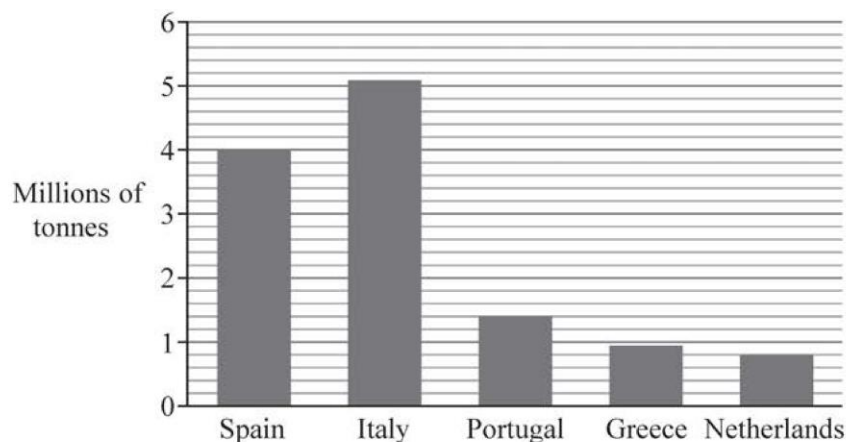
Calculate an estimate for the mean.

.....
(Total for Question is 4 marks)



7 - (4MA0-S 2016-Paper 2FR-Q11) - STATISTICS

The bar chart gives information about the weight of tomatoes, in millions of tonnes, grown in five countries in 2012



The weight of tomatoes grown in Spain in 2012 was greater than the weight of tomatoes grown in the Netherlands in 2012

(a) How much greater?

..... million tonnes
(2)

The weight of tomatoes grown in Portugal in 2012 was 1 400 000 tonnes.
60% of these tomatoes were exported.

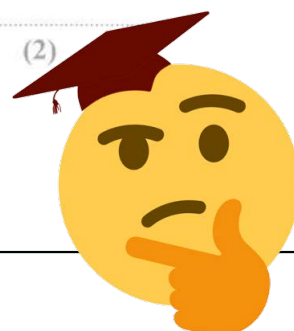
(b) Work out 60% of 1 400 000

.....
(2)

In 2012, the weight of tomatoes grown in France was 0.6 million tonnes.

(c) Write the weight of tomatoes grown in France as a fraction of the weight of tomatoes grown in Spain.
Give your fraction in its simplest form.

.....
(2)



8 - (4MA0-S 2016-Paper 2FR-Q21) - STATISTICS

Here is a list of numbers written in order of size.

3 6 x y

The numbers

have a median of 8

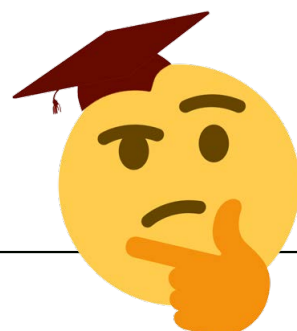
have a mean of 11

Find the value of x and the value of y .

$x =$

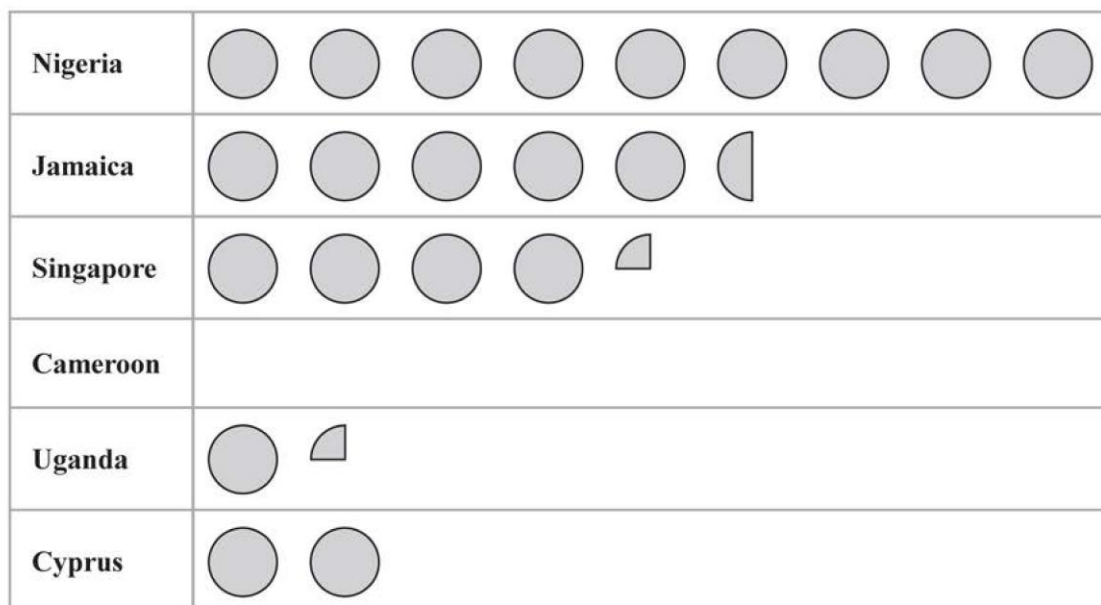
$y =$

3 marks



9 - (4MA0-W 2016-Paper 2FR-Q5) - STATISTICS

The pictogram gives information about the number of medals won by each of five countries in the 2014 Commonwealth Games.



 represents 4 medals

(a) How many medals were won by Nigeria?

.....
(1)

Jamaica won more medals than Cyprus.

(b) How many more?

.....
(2)

Cameroon won 7 medals in the 2014 Commonwealth Games.

(c) Show this information on the pictogram.

.....
(1)

(Total for Question 9 is 4 marks)



10 - (4MA0-W 2016-Paper 2FR-Q20) - STATISTICS

Mr Rowland has a class of 30 students.

He gave them 24 words to spell.

The table shows information about the number of correct spellings for each student.

Number of correct spellings	Frequency
0 – 4	1
5 – 9	5
10 – 14	6
15 – 19	10
20 – 24	8

(a) Write down the modal class.

.....
(1)

(b) Work out an estimate for the mean number of correct spellings.
Give your answer to 1 decimal place.

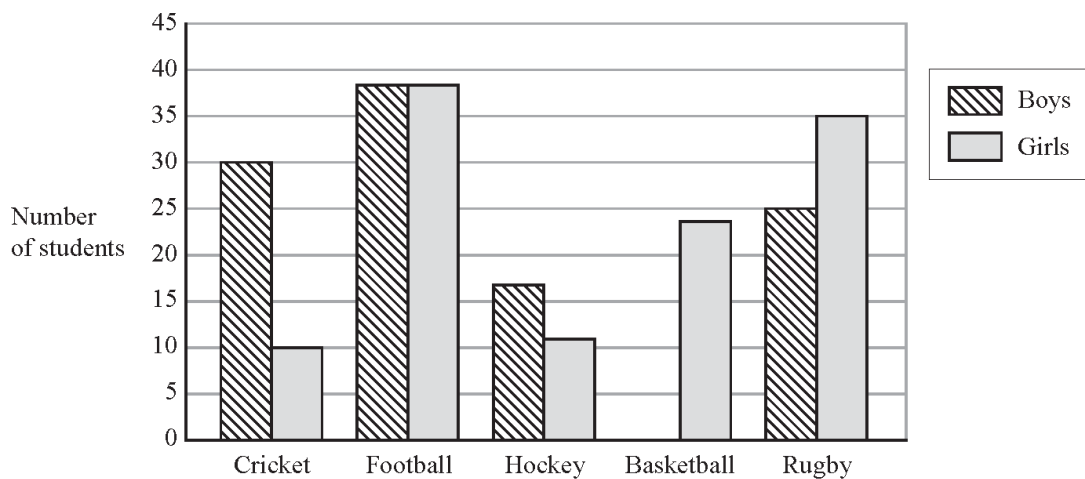
.....
(4)

(Total for Question is 5 marks)



11 - (4MA0-S 2017-Paper 2FR-Q2) - STATISTICS

Students at a college were asked to choose their favourite sport from cricket, football, hockey, basketball and rugby. The bar chart shows some information about their answers.



(a) Which sport was chosen by the same number of boys as girls?

.....
(1)

More boys than girls chose cricket as their favourite sport.

(b) How many more?

.....
(1)

40 boys chose basketball as their favourite sport.

(c) Show this information on the bar chart.

.....
(1)

(d) Find the ratio of the number of boys who chose rugby to the number of girls who chose rugby.

Give your ratio in its simplest form.

.....
(2)



12 - (4MA0-S 2017-Paper 2FR-Q22) - STATISTICS

The frequency table shows information about the distances 60 office workers travel to work each day.

Distance travelled (d km)	Frequency
$0 < d \leq 10$	5
$10 < d \leq 20$	12
$20 < d \leq 30$	17
$30 < d \leq 40$	20
$40 < d \leq 50$	6

- (a) Write down the modal class.

.....
(1)

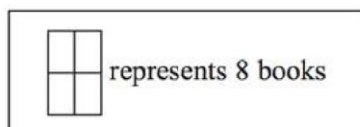
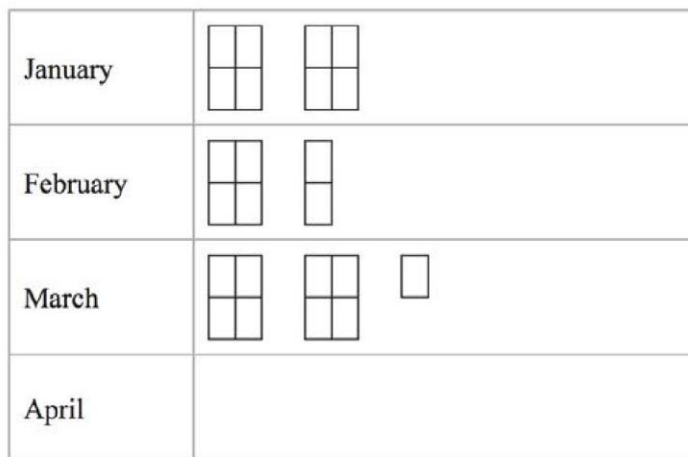
- (b) Work out an estimate for the mean distance travelled to work by these office workers.
Give your answer correct to 1 decimal place.

..... km
(4)



13 - (4MA0-W 2017-Paper 2FR-Q2) - STATISTICS

The pictogram gives information about the number of books Matilda borrowed from a library in January, in February and in March.



(a) How many books did Matilda borrow from the library in January?

.....
(1)

(b) How many books did Matilda borrow from the library in February?

.....
(1)

In April, Matilda borrowed 4 more books than she borrowed in March.

(c) Show this information on the pictogram.

(2)

(Total for Question is 4 marks)



14 - (4MA0-W 2017-Paper 2FR-Q7) - STATISTICS

The table shows information about average temperatures for five months in Beijing.

Month	Average temperature ($^{\circ}\text{C}$)
October	13
November	5
December	-2
January	-4
February	-1

- (a) Which of these months has the lowest average temperature?

.....
(1)

- (b) Work out the difference between the average temperature in October and the average temperature in December.

..... $^{\circ}\text{C}$
(2)

The average temperature in June is 28°C higher than in January.

- (c) Work out the average temperature in June.

..... $^{\circ}\text{C}$
(2)

(Total for Question is 5 marks)



15 - (4MA0-W 2017-Paper 2FR-Q8) - STATISTICS

Here are the distances cycled, in km, on the first 6 days of the 2015 Tour de France cycle race.

Day	1	2	3	4	5	6
Distance (km)	14	166	160	224	190	192

(a) Work out the range of these distances.

..... km
(1)

(b) Work out the median distance.

..... km
(2)

Michel says,

“The median is a better average to use for these 6 distances than the mean.”

(c) Explain why Michel is right.

.....
.....
(1)

(Total for Question is 4 marks)



16 - (4MA0-S 2018-Paper 2FR-Q5) - STATISTICS

Mahtab asks the students in her class how many brothers they each have.
Here are her results.

2 1 3 4 1 0 0 2 3 1
2 2 3 1 1 0 2 4 1 1

(a) Complete the frequency table for her results.

Number of brothers	Tally	Frequency
0		
1		
2		
3		
4		

(2)

(b) Write down the modal number of brothers.

.....
(1)

(c) Write down the fraction of these students who have no brothers.

.....
(1)



17 - (4MA0-S 2018-Paper 2FR-Q10) - STATISTICS

Primrose throws a biased dice 240 times.
The table gives information about her results.

Score	Frequency
1	90
2	30
3	18
4	48
5	16
6	38

Primrose is going to draw a pie chart for her results.

- (a) Work out the angle in the pie chart for a score of 6

.....
(2)

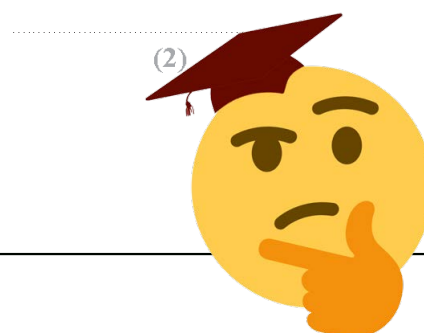
Donatello spins a biased 5-sided spinner a number of times.
He draws a pie chart for his results.

The table gives the angle in the pie chart for each number the spinner lands on.

Number on spinner	Angle in pie chart
1	60°
2	80°
3	100°
4	70°
5	50°

The spinner lands on 3 a total of 250 times.

- (b) Work out the total number of times Donatello spins the spinner.



18 - (4MA0-S 2018-Paper 2FR-Q16) - *STATISTICS*

Three numbers have

- a mean of 17
- a median of 20
- a range of 27

Find the three numbers.

..... ; ;
(Total for Question is 3 marks)



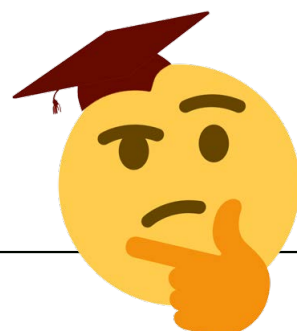
19 - (4MA0-S 2018-Paper 2FR-Q18) - *STATISTICS*

The table gives information about the number of trees in each of 20 gardens.

Number of trees	Frequency
0	2
1	7
2	3
3	4
4	3
5	1

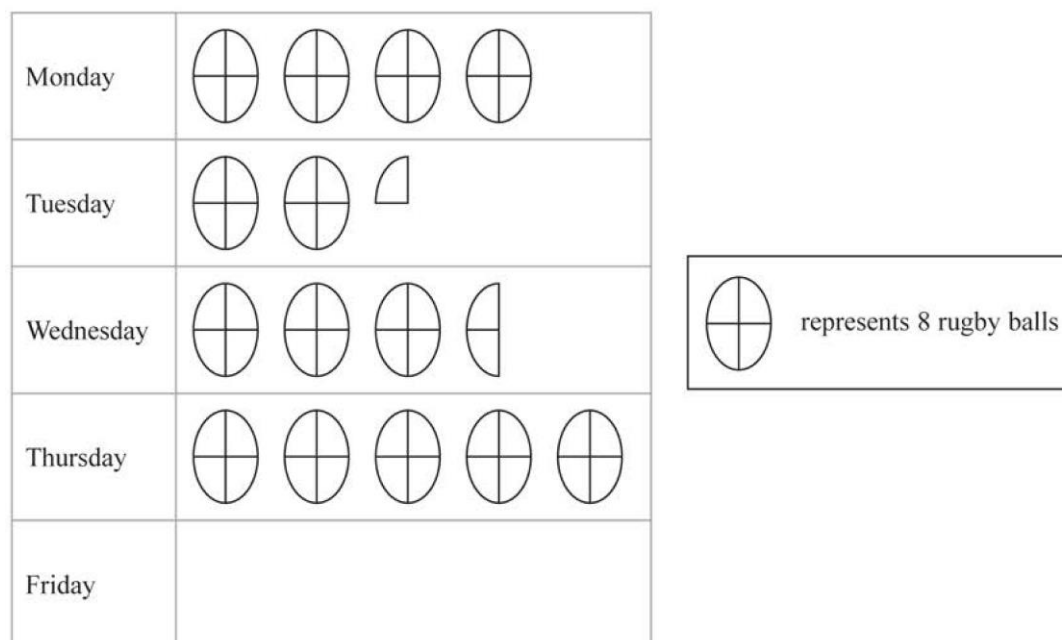
Work out the total number of trees in these gardens.

.....
(Total for Question is 2 marks)



20 - (4MA0-W 2018-Paper 2FR-Q1) - STATISTICS

The pictogram shows information about the number of rugby balls sold each day from Monday to Thursday in a shop.



(a) How many rugby balls were sold on Monday?

.....
(1)

(b) How many rugby balls were sold on Wednesday?

.....
(1)

12 more rugby balls were sold on Friday than on Tuesday.

(c) Use this information to show the number of rugby balls sold on Friday on the pictogram.

(2)



21 - (4MA0-W 2018-Paper 2FR-Q16) - *STATISTICS*

The table gives information about the number of goals scored in each of 40 European Championship football matches.

Number of goals scored	Frequency
0	1
1	8
2	12
3	15
4	4

(a) Write down the modal number of goals scored.

.....
(1)

(b) Find the total number of goals scored.

.....
(2)

Francois has a recording of each of the 40 matches.
He is going to choose at random one of these matches to watch.

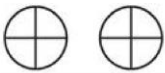
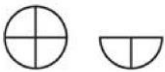
(c) Work out the probability that in this match more than 2 goals were scored.

.....
(2)



22 - (4MA0-W 2019-Paper 2FR-Q1) - STATISTICS

The pictogram gives information about the number of pizzas sold from a shop on Monday, on Tuesday, on Wednesday and on Thursday one week.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

Key:



represents 12 pizzas

(a) Write down the number of pizzas sold from the shop on Monday.

(1)

(b) Write down the number of pizzas sold from the shop on Wednesday.

(1)

30 pizzas were sold from the shop on Friday.

(c) Show this information on the pictogram.

(1)



23 - (4MA0-W 2019-Paper 2FR-Q6) - STATISTICS

Here are the amounts of money, in euros, earned last week by 10 workers in a company.

330 330 250 290 350 330 310 370 320 300

(a) Work out the mean.

(2) euros

(b) Work out the median.

(2) euros

(c) Find the mode.

(1) euros

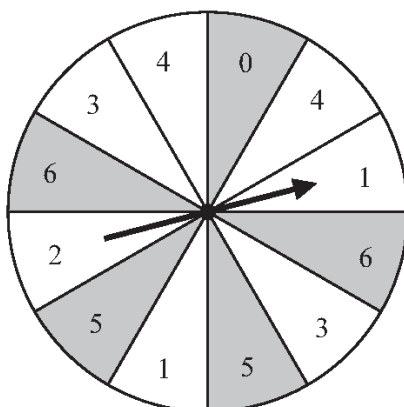
(d) Work out the range.

(2) euros



1 - (4MA0-S 2015-Paper 2FR-Q14) - PROBABILITY

The diagram shows a pointer that spins about the centre of a circle.



The circle is divided into 12 equal sectors.

When the pointer spins, it is equally likely to stop in any one of the sectors.
Each sector has a number.

Andrea spins the pointer.

(a) Find the probability that the pointer stops in a shaded sector.

.....
(1)

(b) Find the probability that the pointer stops in an unshaded sector with an odd number.

.....
(1)

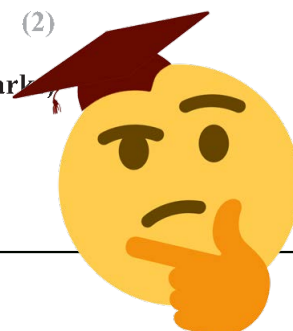
Andrea now spins the pointer twice and adds together the two numbers in the sectors that the pointer stops in.

The probability that the total of the two numbers is 7 or more is $\frac{19}{36}$

(c) Work out the probability that the total of the two numbers is less than 7

.....
(2)

(Total for Question 1 is 4 marks)



2 - (4MA0-S 2015-Paper 2FR-Q23) - PROBABILITY

The table shows the probabilities of people in Wales being in blood group O or in blood group A or in blood group AB.

Blood group	Probability
O	0.44
A	0.42
B	
AB	0.04

All people in Wales are in exactly one of the blood groups O, A, B or AB.

A person is selected at random from the people in Wales.

(a) Find the probability that this person is in blood group B.

.....
(2)

(b) Find the probability that this person is in blood group O or A.

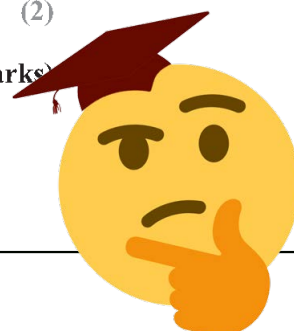
.....
(1)

There are 1200 students in Aled's school.
Aled's school is in Wales.

(c) Work out an estimate for the number of pupils in Aled's school who are in blood group AB.

.....
(2)

(Total for Question is 5 marks)

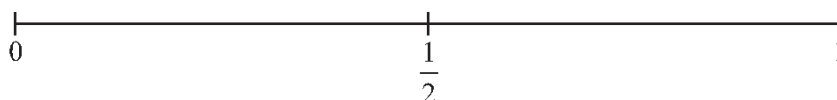


3 - (4MA0-W 2015-Paper 2FR-Q7) - PROBABILITY

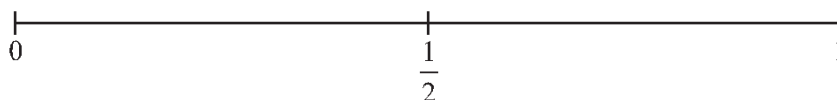
There are three 5 cent coins and three 10 cent coins in a bag.

Amrita takes at random a coin from the bag.

- (a) (i) On the probability scale, mark with a cross (×) the probability that Amrita takes a 5 cent coin.



- (ii) On the probability scale, mark with a cross (×) the probability that Amrita takes a coin with a value of less than 5 cents.



(2)

Here is a list of words that are used to describe the likelihood of an event.

impossible	unlikely	evens	likely	certain
------------	----------	-------	--------	---------

There are three 5 cent coins, three 10 cent coins and three 20 cent coins in a purse.

Jim takes at random a coin from the purse.

- (b) Write down a word from the list to describe the likelihood that the coin has a value of more than 5 cents.

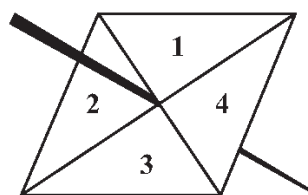
.....
(1)

(Total for Question is 3 marks)

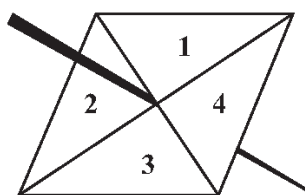


4 - (4MA0-W 2015-Paper 2FR-Q11) - PROBABILITY

Here are two fair spinners.



Spinner A



Spinner B

Shola spins each spinner once.

The score is the sum of the number spinner A lands on and the number spinner B lands on.

(a) Complete the table to show the possible scores.

Spinner B Spinner A	1	2	3	4
1				
2				6
3		5		
4			7	

(2)

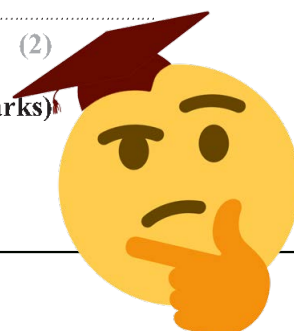
(b) Find the probability that the score will be 3 or less.

(2)

(c) Find the probability that the number spinner A lands on will be greater than the number spinner B lands on.

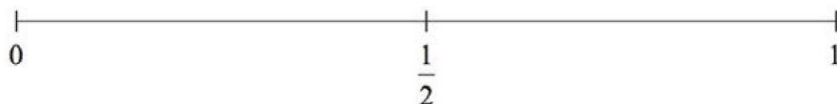
(2)

(Total for Question is 6 marks)

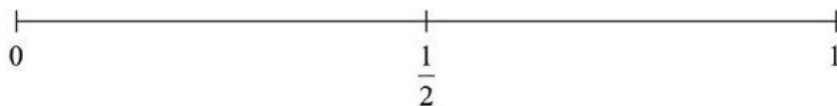


5 - (4MA0-S 2016-Paper 2FR-Q4) - PROBABILITY

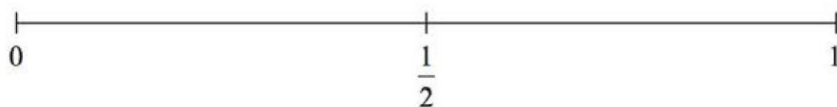
- (i) On the probability scale, mark with a cross (×) the probability that when a fair coin is thrown once it will land Heads.



- (ii) On the probability scale, mark with a cross (×) the probability that when an ordinary fair dice is thrown once it will land on 7



- (iii) On the probability scale, mark with a cross (×) the probability that when an ordinary fair dice is thrown once it will land on 6

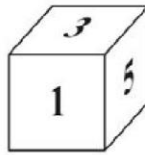


3 marks



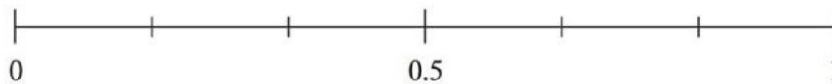
6 - (4MA0-W 2016-Paper 2FR-Q7) - PROBABILITY

A fair dice is thrown.

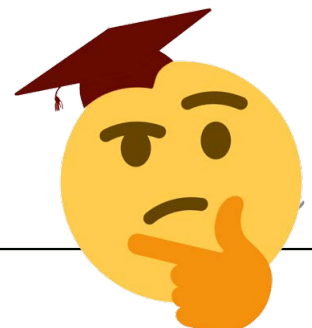


On the probability scale, mark with a cross ($\times$) the probability that

- (i) the dice will land on an even number.
Label this cross **E**.
- (ii) the dice will land on the number 5
Label this cross **F**.
- (iii) the dice will land on a number less than 9
Label this cross **G**.



(Total for Question is 3 marks)



7 - (4MA0-W 2016-Paper 2FR-Q11) - *PROBABILITY*

There are 15 toy bricks in a bag.

There are 7 red bricks
 3 green bricks
 5 yellow bricks

Cristiano takes at random a brick from the bag.
Write down the probability that Cristiano

(i) takes a red brick,

.....
(1)

(ii) takes a blue brick,

.....
(1)

(iii) does **not** take a green brick.

.....
(1)

(Total for Question is 3 marks)



8 - (4MA0-S 2017-Paper 2FR-Q4) - *PROBABILITY*

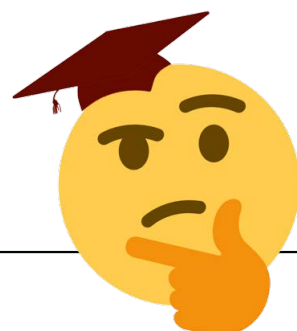
- (a) Write down the probability of an event that is certain to happen.

.....
(1)

The probability that Rocco will pass his driving test is 0.7

- (b) Work out the probability that Rocco will not pass his driving test.

.....
(1)

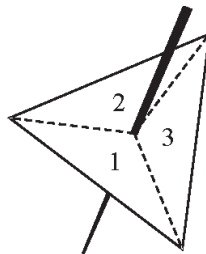
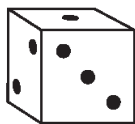


9 - (4MA0-S 2017-Paper 2FR-Q14) - PROBABILITY

In a game, a fair dice is rolled once and a fair spinner is spun once.

The dice has dots showing 1, 2, 3, 4, 5 and 6

The spinner has three sections numbered 1, 2 and 3



The score is found by subtracting the smaller number from the larger number.

- (a) Complete the sample space diagram to show all the possible scores.
Seven scores are shown for you.

		Dice					
		1	2	3	4	5	6
Spinner	1	0	1	2			
	2	1	0				
	3			0		2	

(2)

Pau plays the game.

- (b) Find the probability that his score is

(i) 5

.....

(ii) 2 or 4

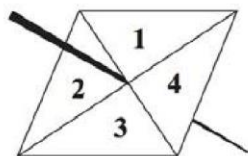
.....

(2)



10 - (4MA0-W 2017-Paper 2FR-Q17) - PROBABILITY

Here is a biased 4-sided spinner.



The spinner is spun.

The table shows the probability that the spinner lands on 1 and the probability that it lands on 2

Number	1	2	3	4
Probability	0.15	0.4		

(a) Work out the probability that the spinner will **not** land on 1

.....
(2)

(b) Work out the probability that the spinner will land on 1 or on 2

.....
(1)

The probability that the spinner will land on 3 is twice the probability that the spinner will land on 4

(c) Work out the probability that the spinner will land on 3

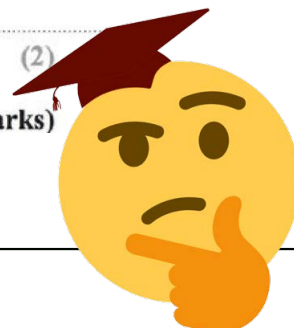
.....
(2)

Daljit is going to spin the spinner 160 times.

(d) Work out an estimate for the number of times the spinner will land on 2

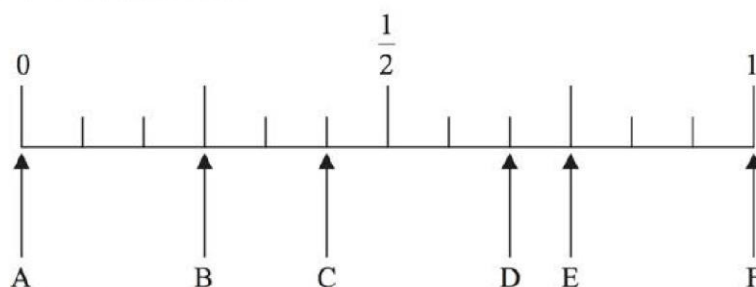
.....
(2)

(Total for Question is 7 marks)



11 - (4MA0-S 2018-Paper 2FR-Q8) - PROBABILITY

A box contains 3 red bricks, 2 yellow bricks and 7 orange bricks.
There are no other bricks in the box.



Edward is going to take at random a brick from the box.

Write down the letter of the arrow that points to the probability that he takes

(i) a red brick,

.....

(ii) a yellow brick or an orange brick,

.....

(iii) a brick that is **not** blue,

.....

(iv) a green brick.

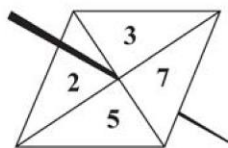
.....

(Total for Question is 4 marks)



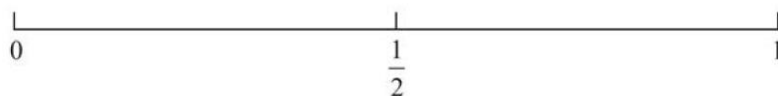
12 - (4MA0-W 2018-Paper 2FR-Q11) - PROBABILITY

Duncan has a fair 4-sided spinner.
The spinner can land on 2, 3, 5 or 7

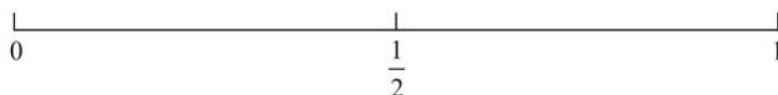


Duncan spins the spinner once.

- (a) (i) On the probability scale, mark with a cross (×) the probability that the spinner lands on 4



- (ii) On the probability scale, mark with a cross (×) the probability that the spinner lands on an odd number.



(2)

Duncan spins the spinner again.

- (b) Complete the table to show all the possible outcomes for the two spins of the spinner.
Six outcomes have been done for you.
(3, 2) means 3 on the first spin and 2 on the second spin.

		Number on the second spin			
		2	3	5	7
Number on the first spin	2	(2, 2)		(2, 5)	
	3	(3, 2)			(3, 7)
	5				
	7		(7, 3)		(7, 7)

(2)

- (c) Find the probability that the number on the first spin is greater than the number on the second spin.

(2)



13 - (4MA0-W 2019-Paper 2FR-Q5) - PROBABILITY

There are 6 coins in a bag.

- 2 of the coins are 5 cent coins
- 1 of the coins is a 10 cent coin
- 3 of the coins are 20 cent coins

Gregor takes at random a coin from the bag.

- (a) On the probability scale, mark with a cross (×) the probability that the coin is a 5 cent coin.



(1)

- (b) On the probability scale, mark with a cross (×) the probability that the coin is a 50 cent coin.



(1)

Here are some words that can be used to describe likelihood.

impossible	unlikely	evens	likely	certain
------------	----------	-------	--------	---------

- (c) Choose the word from the box that best describes the likelihood that the coin is a 10 cent coin.

(1)



14 - (4MA0-W 2019-Paper 2FR-Q13) - *PROBABILITY*

Hamid puts 3 white counters and 5 grey counters into a bag.
Each counter has a number on it.



Hamid takes at random a counter from the bag.

(a) Write down the probability that the number on the counter is **3**

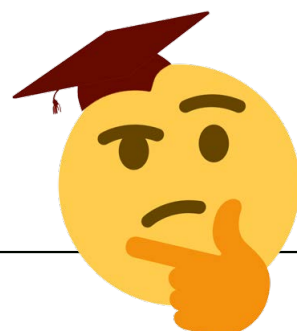
(1)

(b) Write down the probability that the counter does **not** have the number **1** on it.

(1)

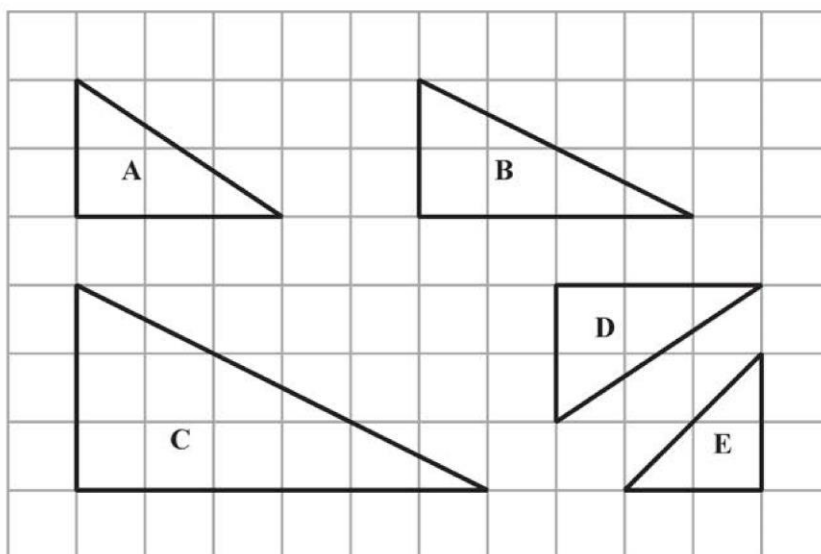
(c) Write down the probability that the counter is grey with the number **1** on it.

(1)



1 - (4MA0-S 2016-Paper 2FR-Q5) - TRANSFORMATION

Here are five triangles drawn on a square grid.



(a) Write down the letters of the two triangles that are congruent.

.....
(1)

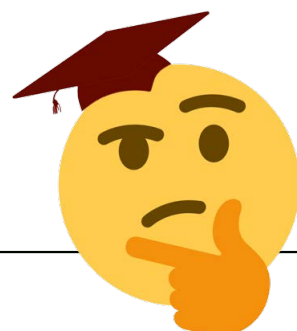
One of the triangles is similar to triangle **B**.

(b) Write down the letter of this triangle.

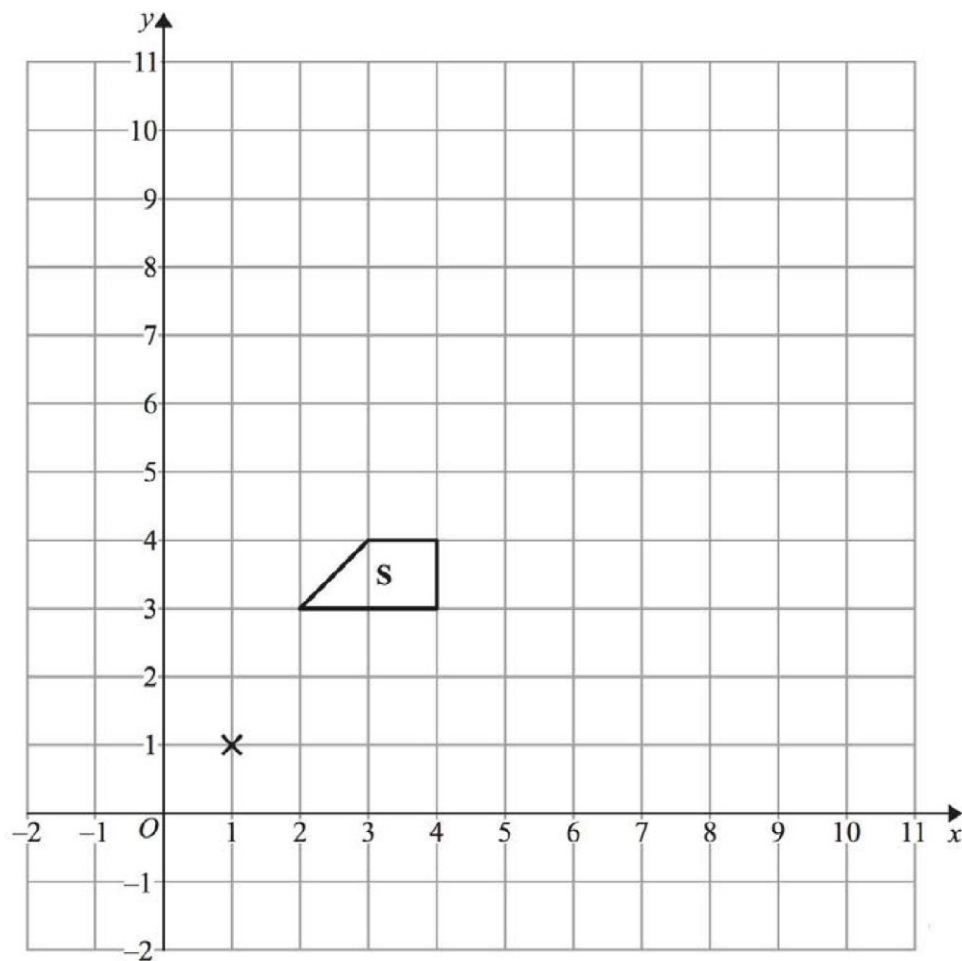
.....
(1)

(c) Write down the letter of the triangle that has one line of symmetry.

.....
(1)



2 - (4MA0-S 2016-Paper 2FR-Q15) - TRANSFORMATION

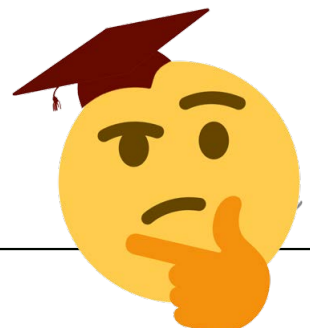


- (a) Enlarge shape S, by scale factor 2, centre (1, 1).
Label the new shape T.

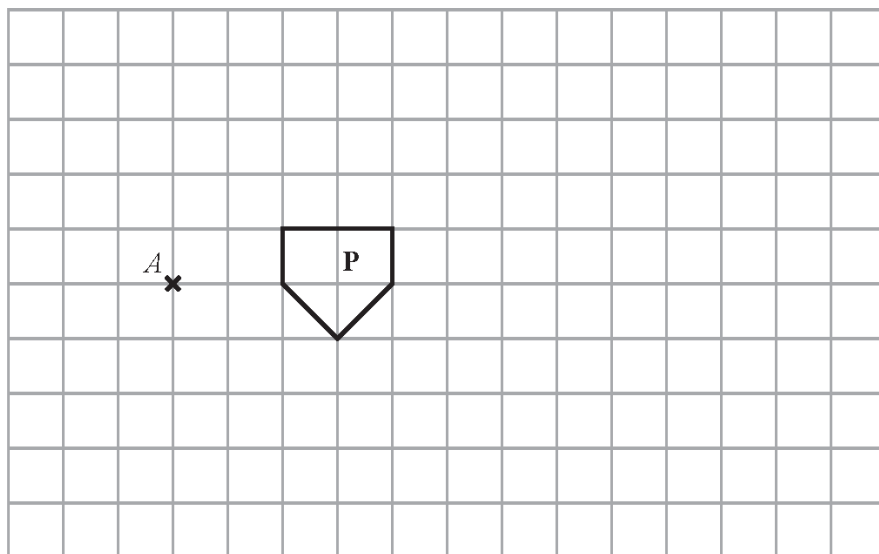
(2)

- (b) Describe fully the single transformation that maps shape T onto shape S.

(1)

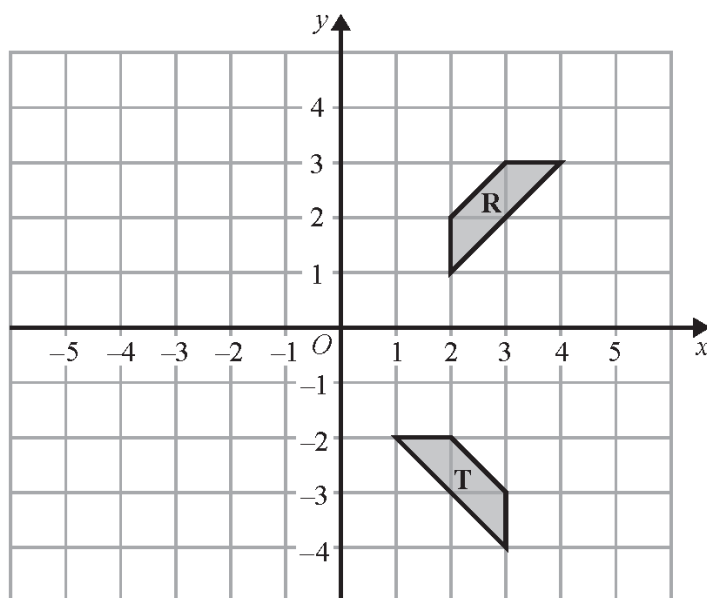


3 - (4MA0-S 2018-Paper 2FR-Q20) - TRANSFORMATION



(a) On the grid, enlarge shape P with scale factor 3 and centre A .

(2)



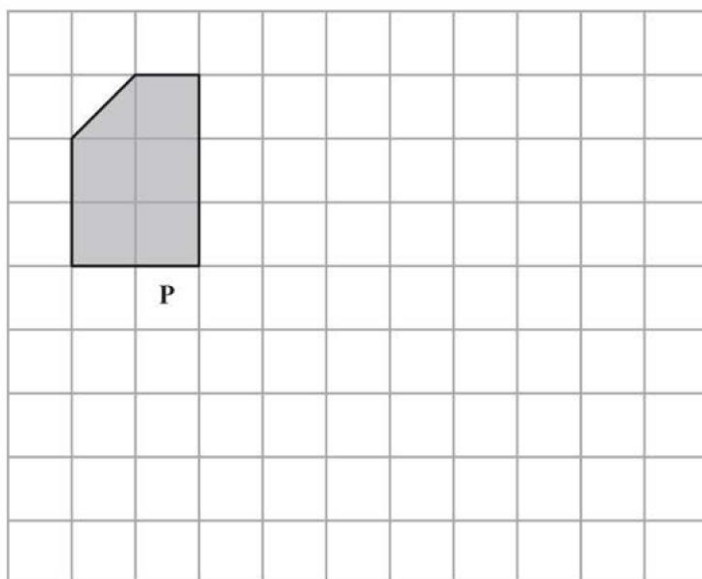
(b) Describe fully the single transformation that maps shape R onto shape T .

(3)



4 - (4MA0-W 2018-Paper 2FR-Q12) - TRANSFORMATION

The diagram shows shape **P** on a centimetre grid.



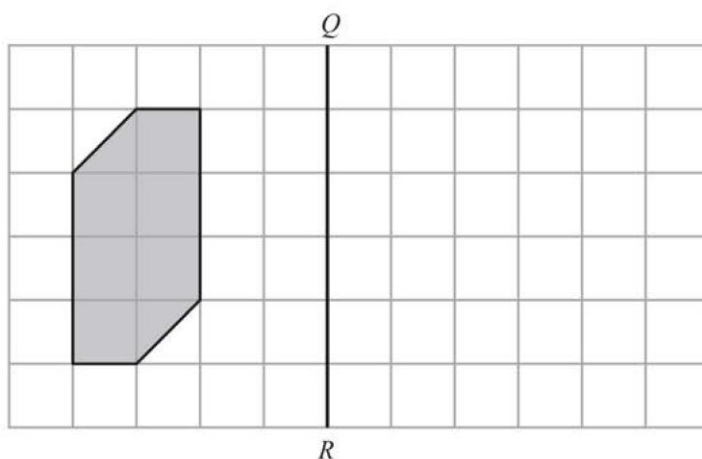
- (a) (i) Find the area of shape **P**.

.....cm²

- (ii) On the grid above, draw a shape that is similar but not congruent to shape **P**.

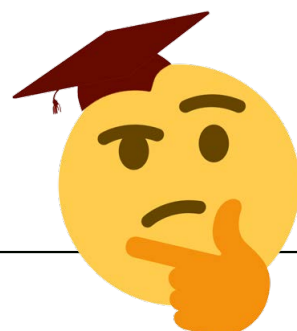
(2)

The diagram shows a shape on a centimetre grid and a line QR .

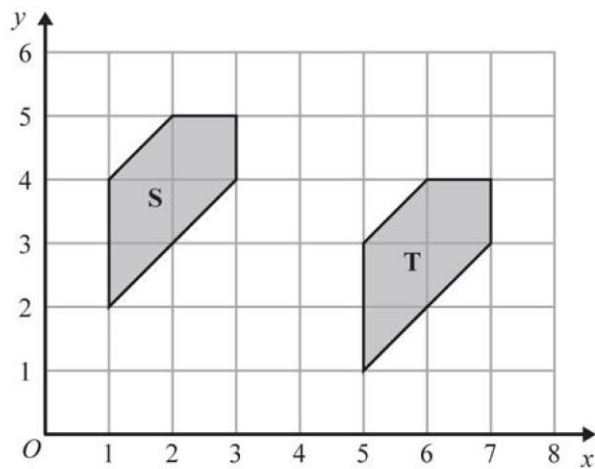


- (b) On the grid, reflect the shape in the line QR .

(2)

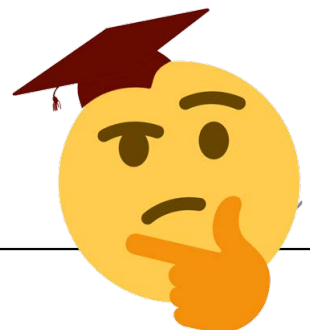


The diagram shows shape **S** and shape **T** on a centimetre grid.



(c) Describe fully the single transformation that maps shape **S** onto shape **T**.

(2)



ANSWERS



1 - (4MA0-S 2015-Paper 2FR-Q1) - NUMBER

(a)		$\frac{3}{100}$
(b)		57
(c) (i)		3.004
(c) (ii)		3.2
(d)		30.8

2 - (4MA0-S 2015-Paper 2FR-Q2) - NUMBER

(a)		$\frac{3}{7}$
(b)		8
(c)		0.8
(d)		$\frac{12}{52}$

3 - (4MA0-S 2015-Paper 2FR-Q6) - NUMBER

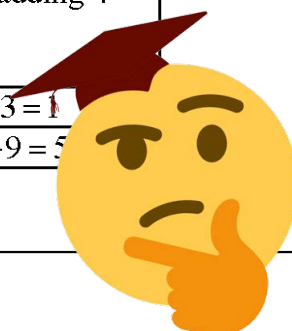
(a) (i)		67
(a) (ii)		43
(b)		subtract 8
(c)		-5
(d)		8
(e)		368

4 - (4MA0-S 2015-Paper 2FR-Q7) - NUMBER

(a)	$\frac{40}{100}$	
		$\frac{2}{5}$
(b)		60
(c)	70 : 42	
		1 : 0.6

5 - (4MA0-S 2015-Paper 2FR-Q8) - NUMBER

(a)		She should have multiplied 9×3 before adding 4
(b) (i)		$4 - 3 = 1$
(b) (ii)		$45 \div 9 = 5$



6 - (4MA0-S 2015-Paper 2FR-Q12) - NUMBER

(a)		15 55
(b) (i)		4.50 pm
(b) (ii)	10 min + 2 hr + 12 min or 18 hr 72 min – 16 hr 50 min or 3 hr – (50 – 12) min	
		2 hour 22 minutes
(c)		2159
(d)	$\frac{638}{2.75}$ or $\frac{638}{2\frac{3}{4}}$ or $\frac{638}{11\frac{1}{4}}$ or $\frac{638}{11} \times 4$ or $\frac{638}{165} \times 60$ oe	
		232

7 - (4MA0-S 2015-Paper 2FR-Q15) - NUMBER

(a)		196
(b)		343
(c)		97
(d)		3^4
(e) (i)		3.2710
(e) (ii)		3.3



8 - (4MA0-S 2015-Paper 2FR-Q19) - NUMBER

(a)	Eg $\frac{7\frac{1}{2}}{100} \times 15000$ or 0.075×15000 oe or 1125 or $0.075 \times 15000 + 15000$ or 15000×1.075 oe	
		16125
(b)	Eg $\frac{1800}{8} \times 108$ or $\frac{1800}{0.08} \times 1.08$ or 22500×1.08 or $\frac{1800}{0.08} + 1800$ or $\frac{1800}{8} \times 100 + 1800$ or $225 \times 100 + 1800$ or $22500 + 1800$	
		24300

9 - (4MA0-S 2015-Paper 2FR-Q21) - NUMBER

(a)	$\frac{175}{7} \times 9$	
		225
(b)	$\frac{400}{27+14+9} \times 27$ oe or $\frac{400}{27+14+9}$ or $\frac{400}{50}$ or 8	
		216

10 - (4MA0-W 2015-Paper 2FR-Q5) - NUMBER

	3×1000 or $340 \div 1000$	
	$3000 \div 340$ or $3 \div 340 = 8.82...$	
		8

11 - (4MA0-W 2015-Paper 2FR-Q6) - NUMBER

a		19 00
b	8:40 to 9:40 to 10:00 $+(45 - 20)$ $8:40 + 1:45 = 9:85$	
		10:25
c	$\frac{40}{60}$	$\frac{2}{3}$



12 - (4MA0-W 2015-Paper 2FR-Q8) - NUMBER

	$84 \div 3 = 28$	
	$84 - 28$ or 2×28	
		56

13 - (4MA0-W 2015-Paper 2FR-Q13) - NUMBER

a		3
b		-14
c	$20 + '14'$	34

14 - (4MA0-W 2015-Paper 2FR-Q15) - NUMBER

a		23
b	$1200 \div 8 \times 12$	
		1800

15 - (4MA0-W 2015-Paper 2FR-Q21) - NUMBER

a		$8 \times 10 + 1, 81, 9^2$
b		19
ci		$n(n+2)+1$
ii		$(n+1)^2$

16 - (4MA0-W 2015-Paper 2FR-Q25) - NUMBER

a	$224 = 2 \times 112 = 2 \times 2 \times 56 =$ $2 \times 2 \times 2 \times 28 = 2 \times 2 \times 2 \times 2 \times 14$ $2 \times 2 \times 2 \times 2 \times 7$	
		$2^5 \times 7$
b	$56 + 32 + 16$ $56 + 32 + 14$ $56 + 28 + 16$	
		eg. 56, 32, 16 or 56, 32, 14 or 56, 28, 16



17 - (4MA0-S 2016-Paper 2FR-Q2) - NUMBER

a		18	1
b		40	1
c		10 squares shaded	1

18 - (4MA0-S 2016-Paper 2FR-Q6) - NUMBER

a		131, 644, 2236, 2466, 4576	1
b		1822	1
c		1885	1
d		22	1

19 - (4MA0-S 2016-Paper 2FR-Q7) - NUMBER

$4 \times 1.25 (=5)$ or $2 \times 2.90 (=5.8(0))$		3
$20 - (4 \times 1.25 + 2 \times 2.90)$	9.2(0)	

20 - (4MA0-S 2016-Paper 2FR-Q12) - NUMBER

a	$-7 + 20$ oe	13	2
b	$\frac{-7 + -6 + -1 + 4 + 3(+0 + 0)}{7}$	-1	2
c	$4 - -7$ oe	11	2

21 - (4MA0-S 2016-Paper 2FR-Q13) - NUMBER

a	$2.50 + 2.95 \times 3$		11.35	2
b	$26.10 - 2.50$ (= 23.60)	$(26.10 - '11.35')$ $\div 2.95 (= 5)$		3
	'23.60' $\div 2.95$	'5' + 3		
			8	



22 - (4MA0-S 2016-Paper 2FR-Q14) - NUMBER

a	0.625, 0.58, 0.6(0), 0.62	58%, 0.6, $\frac{31}{50}$, $\frac{5}{8}$	2
b	$\frac{5}{8} \times 72 = 45$	$1 - \frac{5}{8} = \frac{3}{8}$	3
	72 – ‘45’	$\frac{3}{8} \times 72$	
		27	

23 - (4MA0-S 2016-Paper 2FR-Q16) - NUMBER

eg $\frac{9}{24} + \frac{5}{24} = \frac{14}{24}$	Shown	2
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24 - (4MA0-S 2016-Paper 2FR-Q18) - NUMBER

a	$\frac{1.75}{2.1} \times 100$ oe	83.3	2
b	$54.99 \times 5.52 (= 303.(54...))$ or $343 \div 5.52 (= 62.(137...))$	39	3
	$343 - (54.99 \times 5.52) (= 39.(45...))$ or $(343 \div 5.52) - 54.99 (= 7.(14...))$		
c	7h 24 min = 7.4 h $\left(\text{or } 7\frac{24}{60} \right)$ oe or 444 (mins) or 26640 (secs)	746	3
	$\frac{5522}{7.4}$ or $\frac{5522}{444} \times 60$ or $\frac{5522}{26640} \times 3600$		



25 - (4MA0-S 2016-Paper 2FR-Q23) - NUMBER

a	8000:50 or 50:8000 or $\frac{8000}{50}$		160	2
b	$\frac{72}{80} \times 50$ oe	$72 \times 100 \div '160'$	45	2

26 - (4MA0-W 2016-Paper 2FR-Q1) - NUMBER

(a)		-11, -9, -2, 3, 5
(b)		0.007, 0.072, 0.7, 0.703, 0.72
(c)		70
(d)	$8 + 12$	20

27 - (4MA0-W 2016-Paper 2FR-Q2) - NUMBER

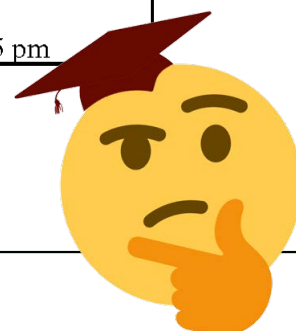
(a)		Eight thousand, two hundred and one
(b)		Four Hundred /4 hundred/400
(c)		8850
(d)		9000
(e)		239
(f)		8516 & 8463
(g)	$(8516 + 8586)/2$	8551
(h)		8.85(0)

28 - (4MA0-W 2016-Paper 2FR-Q3) - NUMBER

(a) (i)		293
(a) (ii)		19.4
(b)		$(7-2) \times (5+7)$

29 - (4MA0-W 2016-Paper 2FR-Q9) - NUMBER

(a)		1910
(b)		9:15 pm



30 - (4MA0-W 2016-Paper 2FR-Q13) - NUMBER

	$20 - (2 \times 2.43 + 2.29 + 0.5 \times 9.54)$	
		8.08

31 - (4MA0-W 2016-Paper 2FR-Q16) - NUMBER

(a)		$\frac{7}{100}$
(b)	$0.16x = 192$ or $16\% = 192$ oe or $\frac{192}{16} (=12)$	
	$\frac{192}{0.16}$ or $\frac{192}{16} \times 100$ oe	
		1200

32 - (4MA0-W 2016-Paper 2FR-Q19) - NUMBER

	$1\frac{24}{60}$ or 1.4 or 84	
	$\frac{725}{1.4}$ oe or $\frac{725}{84} \times 60$	
		518

33 - (4MA0-W 2016-Paper 2FR-Q21) - NUMBER

	$\frac{3 \times 5}{20} + \frac{4 \times 4}{20}$ or $\frac{15}{20} + \frac{16}{20}$	
		$\frac{31}{20}$
	Alternative $0.75 + 0.8 = 1.55$	
		$1\frac{55}{100}$



34 - (4MA0-W 2016-Paper 2FR-Q22) - NUMBER

(a)	$(40 \div 16) \times 240$ oe	600
(b)	$(600 \div 120) \times 16$ oe	80
(c)	$240 \div 150$ or $150 : 240$ oe	1.6 oe

35 - (4MA0-S 2017-Paper 2FR-Q1) - NUMBER

(a)		24016	1	B1
(b)		88000	1	B1
(c)		$\frac{3}{10}$	1	B1 (three) tenth(s) 0.3
(d)		42 or 49	1	B1 Either 42 or 49 (or both with no other number)
(e)	Eg $\frac{5}{8} \times 48$ or $\frac{1}{8} \times 240$ or $48 \div 8 \times 5$	30	2	M1 For a complete method A1
(f)	Eg $\frac{60}{100} \times 750$ or $\frac{750}{10} \times 6$ or 6×75	450	2	M1 For a complete method A1

36 - (4MA0-S 2017-Paper 2FR-Q3) - NUMBER

(a)		-20, -15, -10, -5	1	B1 Numbers all correctly marked
(b)		-7, -4, -2, 3, 5, 8	1	B1 All correctly ordered
(c)	$72 + 58$ or $72 - -58$ or $-58 - 72$	130	2	M1 For a complete method A1 Allow -130

37 - (4MA0-S 2017-Paper 2FR-Q5) - NUMBER

(a) (i)		218	1	B1
(ii)		238	1	B1
(iii)		2673	1	B1
(iv)		24	1	B1
(b)		$7 \times (3 + 8) - 2$	1	B1
(c)		39	1	B1
(d)		10280	2	M1 Any one of 10000, 64 or 216 A1 10280

38 - (4MA0-S 2017-Paper 2FR-Q7) - NUMBER

(a) (i)		centimetres	1	B1 cm allow any unambiguous spelling
(ii)		kilograms	1	B1 kg allow any unambiguous spelling
(iii)		Square metres	1	B1 m ² allow any unambiguous spelling
(b)	3×150 or 3×0.15 $2000 - 3 \times 150$ or 1550 or $2 - 3 \times 0.15$ or 1.55	1550 ml Or 1.55 l	3	M1 or for 2×1000 or 2000 or $150 \div 1000$ or 0.15 or $450 \div 1000$ or 0.45 M1 A1 SCB1 for 1850 ml or 1.85 l



39 - (4MA0-S 2017-Paper 2FR-Q11) - NUMBER

(a)		1830	1	B1
(b)		3 hrs 45 mins 9 25 pm	2	M1 45 mins or 3 hours or evidence of adding on to 10 30 and subtracting 15 mins to get to 1015 oe A1 3 hours 45 minutes
(c)			1	B1 9 25 (pm) or 2125

40 - (4MA0-S 2017-Paper 2FR-Q12) - NUMBER

		CB, CD, CF TB, TD, TF	2	M1 For at least 3 correct combinations or for all correct with repeats A1 All correct and no repeats
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41 - (4MA0-S 2017-Paper 2FR-Q17) - NUMBER

(a)	Eg $\frac{30}{12} \times 110$ or 2.5×110 or $\frac{30}{12}$ or 2.5 or $\frac{110}{12} \times 30$ or 9.16(666...) $\times 30$ or $\frac{110}{12}$ or 9.16(666...) oe	275	2	M1 Accept 9.16(666...) rounded or truncated to at least 3 SF A1
(b)	Eg $\frac{375}{100} \times 12$ or 3.75×12 or $375 \div \frac{100}{12}$ or $375 \div 8.33(333...)$ or $\frac{12}{100} \times 375$ or 0.12×375	45	2	M1 For a complete method Accept 8.33(333...) rounded to at least 3 SF A1

42 - (4MA0-S 2017-Paper 2FR-Q19) - NUMBER

		14.37028405	2	M1 102.66 or 1.843(9...) or 7.143(9...) A1 Accept 14.37(028.....) rounded or truncated to at least 4SF
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43 - (4MA0-S 2017-Paper 2FR-Q24) - NUMBER

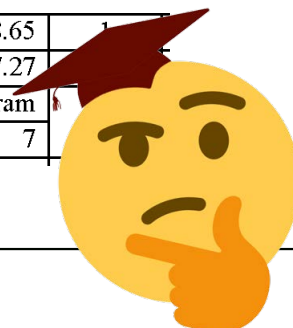
	$\frac{16}{5}$ and $\frac{8}{3}$ $\frac{16}{5} \times \frac{3}{8}$ or $\frac{48}{15} \div \frac{40}{15}$	A fully correct method shown	3	M1 For at least one correct improper fraction M1 Dep For first fraction unchanged, changing $\div$ to $\times$ and inverting the 2 nd fraction or Converting each fraction with a common denominator of 15 (or multiple of 15) with $\div$ sign A1 $\frac{48}{40}$ from correct working
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44 - (4MA0-W 2017-Paper 2FR-Q1) - NUMBER

(a)		5073	1
(b)		300	1
(c)		1889	1

45 - (4MA0-W 2017-Paper 2FR-Q4) - NUMBER

(a)		8.65	1
(b)		7.27	1
(c)(i)		7.235 marked on diagram	1
(c)(ii)		7	1



46 - (4MA0-W 2017-Paper 2FR-Q6) - NUMBER

(a)		13	1
(b)		Add 3	1
(c)	$4 + 11 \times 3$ or $4 + 12 \times 3$ or $3n + 1$ Or 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37		
		37	2
(d)	$67 - 1$ or $3x + 1 = 67$	22	2

47 - (4MA0-W 2017-Paper 2FR-Q10) - NUMBER

$20 - 6 \times 2.96$		
	£2.24	3

48 - (4MA0-W 2017-Paper 2FR-Q11) - NUMBER

(a)		$\frac{23}{100}$	1
(b)	Eg 0.533(33...), 0.555(55....), 0.59, 0.6, 0.61	$\frac{8}{15}, \frac{5}{9}, 0.59, \frac{3}{5}, 61\%$	
			3

49 - (4MA0-W 2017-Paper 2FR-Q13) - NUMBER

(a)		729	1
(b)		89	1
(c)(i)		4.1601(0167646)	
(c)(ii)		4.2	2



50 - (4MA0-W 2017-Paper 2FR-Q16) - NUMBER

(a)	e.g. $\frac{100}{24} \times 30$		2
		125	
(b)	e.g. $\frac{850}{300} \times 24$ or $850 \div \frac{300}{24}$ oe		2
		68	

51 - (4MA0-W 2017-Paper 2FR-Q20) - NUMBER

$\frac{35}{100} \times 1200$ oe or 420		3
1200 - "420"		
	780	

52 - (4MA0-W 2017-Paper 2FR-Q24) - NUMBER, TRIGONOMETRY

(a)	$\cos x = \frac{60}{110}$ or $\cos x = 0.545(4545\dots)$		3
	$(x =) \cos^{-1}\left(\frac{60}{110}\right)$		
		56.9	
(b)	$90 - 56.9(4426885\dots)$ oe	033	2
(c)(i)		105	2
(c)(ii)		115	

53 - (4MA0-S 2018-Paper 2FR-Q1) - NUMBER

(a)		176	1	B1
(b)(i)		Arrow pointing to 2.28	1	B1
(ii)		0.08	1	B1 oe, e.g. $\frac{2}{25}$
(c)		0.0011, 0.063, 0.07, 0.6, 0.77	1	B1
(d)	$(12.9+13.7) \div 2$ or $12.9 + (13.7 - 12.9) \div 2$	13.3	2	M1 A1 any complete method to find halfway value



54 - (4MA0-S 2018-Paper 2FR-Q2) - NUMBER

(a)(i)		millilitres	1	B1	Condone incorrect spelling if meaning clear. Allow ml or cm ³
(ii)		centimetres	1	B1	Condone incorrect spelling if meaning clear. Allow cm.
(b)		4300	1	B1	

55 - (4MA0-S 2018-Paper 2FR-Q4) - NUMBER

(a)		6079	1	B1	
(b)		400	1	B1	Hundred(s), 4 hundred(s), 100
(c)		72.2	1	B1	
(d)	18, 36, 54, 72, 90, 108, 126, 144, 162, 180, ...	e.g. 18, 36	1	B1	Any two multiples of 18
(e)		70	1	B1	
(f)		$25 + 3 \times (7 - 2) = 40$	1	B1	Correct brackets
(g)		8607	1	B1	

56 - (4MA0-S 2018-Paper 2FR-Q6) - NUMBER

(a)		Kazan	1	B1	Accept -12
(b)		15	1	B1	Accept -15
(c)		11	1	B1	

57 - (4MA0-S 2018-Paper 2FR-Q7) - NUMBER

	$40 - 19.50 (= 20.5(0))$ or $40 - 8.56 (= 31.44)$	6	4	M1	Correct method to find money left after taking away cost of rake or change
	$40 - 19.50 - 8.56 (= 11.94)$			M1	Correct method to find money left after taking away cost of rake & change
	"11.94" $\div$ 1.99			M1	A fully correct method to find number of packets of seed
				A1	

58 - (4MA0-S 2018-Paper 2FR-Q9) - NUMBER

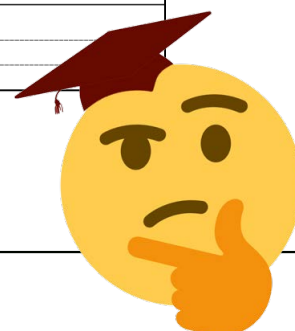
(a)		16 45	1	B1	
(b)		130	1	B1	
(c)		8 19 pm	1	B1	Accept 20 19

59 - (4MA0-S 2018-Paper 2FR-Q13) - NUMBER

(a)		10	1	B1	
(b)	$7 \div 0.5$ or 7 km in 0.5 hours oe	14	2	M1	
				A1	
(c)		"Horizontal" line from (2 10, 16) to (2 50, 16) "Diagonal" line from (2 50, 16) to (3 50, 0)	2	M1	For correct horizontal line or diagonal line with negative gradient to (3 50, 0)
				A1	Fully correct graph

60 - (4MA0-S 2018-Paper 2FR-Q14) - NUMBER

	$360 \div 1.25 (= 288)$ or $425 \times 0.72 (= 306)$	18	3	M1	
	$360 \div 1.25 (= 288)$ and $425 \times 0.72 (= 306)$			M1	
				A1	cao



61 - (4MA0-S 2018-Paper 2FR-Q15) - NUMBER

	$39\,000 \div 3 (=13\,000)$ oe	9	5	M1 $\frac{1}{3} \times 39\,000$ oe	M2 for $\frac{2}{3} \times 39\,000$
	$39\,000 - '13\,000' (=26\,000)$ oe			M1	
	$0.55 \times 5\,300 (=2915)$ oe			M1 A correct method to find 55% of 5 300	
	$'26\,000' \div '2915' (=8.919...)$			M1 A correct method to find the number of weeks A1	

62 - (4MA0-S 2018-Paper 2FR-Q19) - NUMBER

	$\frac{6}{100} \times 8.50$ or 0.06×8.50 or 0.51 or 51p	9.01	3	M1	M2 for 1.06×8.50 oe
	$8.50 + '0.51'$			M1 dep	
				A1	

63 - (4MA0-S 2018-Paper 2FR-Q24) - NUMBER

	eg $280 = 2 \times 140 = 2 \times 2 \times 70 (=2 \times 2 \times 2 \times 35 = 2 \times 2 \times 2 \times 5 \times 7)$ eg $280 = 10 \times 28 = 2 \times 5 \times 28 (=2 \times 5 \times 2 \times 14 = 2 \times 5 \times 2 \times 2 \times 7)$ 2, 2, 2, 5, 7	$2 \times 2 \times 2 \times 5 \times 7$	3	M1	for at least 2 correct steps in repeated factorisation (may be seen in a tree diagram)
				A1dep	For all correct factors, may include 1
				A1dep	Must see correct method Accept $2^3 \times 5 \times 7$

64 - (4MA0-W 2018-Paper 2FR-Q2) - NUMBER

(a)		79 or 83	1	B1
(b)		24 or 48	2	M1 M1 for 8, 16.... or 12,24.... A1 For 24 or 48 SCB1 for 16, 32, 36, 40
(c)(i)		2 or 18 or 22	1	B1
(ii)		9	1	B1
(iii)		27	1	B1

65 - (4MA0-W 2018-Paper 2FR-Q6) - NUMBER

(a)		$\frac{5}{12}$	1	B1
(b)		0.8	1	B1
(c)	Any fraction equivalent to	$\frac{6}{18}$	1	B1
(d)		29	1	B1
(e)		4.5	1	B1

66 - (4MA0-W 2018-Paper 2FR-Q7) - NUMBER

(a)(i)		metres	1	B1	Accept m
(ii)		grams	1	B1	Accept g
(b)(i)		15 12	1	B1	
(ii)	Eg 3 12 to 5 12 to $600 + (55 - 48)$ or $3\,12 + 255$ or 567	607 (pm)	2	M1 A1	For a complete method Accept 18 07



67 - (4MA0-W 2018-Paper 2FR-Q8) - NUMBER

(a)		0.09, 0.16, 0.203, 0.28, 0.51	1	B1
(b)		7	1	B1
(c)		10.3	1	B1
(d)		420	1	B1

68 - (4MA0-W 2018-Paper 2FR-Q13) - NUMBER

(a)	$190 \div 12$ or $15.8(333....)$	15	2	M1 For $15 \times 12 (=180)$ or $16 \times 12 (=192)$
(b)	$190 - 15 \times 12$ or $190 - 180$ or $0.8(333...) \times 12$	10	2	A1 M1ft Provided answer in (a) is an integer less than 15 A1

69 - (4MA0-W 2018-Paper 2FR-Q14) - NUMBER

	$\frac{400}{5+3}$ or 50 or $\frac{400}{5+3} \times 5 (=250)$ or $\frac{400}{5+3} \times 3 (=150)$ "50" $\times 2$	100	3	M1 M1 For $\frac{400}{5+3} \times 5 (=250)$ and A1 $\frac{400}{5+3} \times 3 (=150)$
	Alternative Method	100	3	M2 A1 For $\frac{2}{8} \times 400$

70 - (4MA0-W 2018-Paper 2FR-Q15) - NUMBER

(a)	$36 \times \frac{12}{100}$ oe (= 4.32) $36 - "4.32"$	31.68	3	M1 M1 M2 for a complete method Eg 0.88×36 oe
(b)	$\frac{81}{180} \times 100$ (%)	45	2	A1 M1 A1 For $\frac{81}{180}$ oe

71 - (4MA0-W 2018-Paper 2FR-Q20) - NUMBER

(i)		1, 2, 23, 31, 46, 62, 713, 1426	3	B3 Accept factor written as products. If not B3 then B2 for three of 1, 46, 62, 713, 1426 If not B2 then B1 for one of 46, 62, 713 or four of 1, 2, 23, 31, 1426
(ii)		23×31	1	B1

72 - (4MA0-W 2019-Paper 2FR-Q3) - NUMBER

(a)	$100 - (13 + 16 + 8 + 5 + 15 + 20)$	23	2	M1 A1
(b)		0.16	1	B1
(c)		$\frac{13}{100}$	1	B1 or any correct equivalent fraction
(d)	$\frac{15}{100} \times 8000$	1200	2	M1 A1



73 - (4MA0-W 2019-Paper 2FR-Q9) - NUMBER

(a)	1,2,3,4,6,9,12, 18,36			M1 list at least 4 correct factors with no incorrect factors A1 or 1 & 18, or 3 & 12, or 4 & 12, or 6 & 12
(b)		e.g. 6 & 9	2	M1 A number, greater than 50 with at least two distinct factors from 2, 3 and 5
		e.g. 60	2	A1 Any multiple of 30 greater than 50

74 - (4MA0-W 2019-Paper 2FR-Q14) - NUMBER

	(Machine A or B =) $14 \times 24 \times 7 (= 2352)$ or (Machine C =) $18 \times 24 \times 7 (= 3024)$ $2 \times '2352' + '3024' (= 7728)$ $'7728' \div 120 (= 64.4)$	65		M1 output of at least 1 machine per week
	Alt: $2 \times 14 + 18 (= 46)$ $'46' \times 24 \times 7 (= 7728)$ $'7728' \div 120 (= 64.4)$	65	4	M1 dep M1 dep on M2 A1 cao M1 total output per day M1 dep M1 dep on M2 A1

75 - (4MA0-W 2019-Paper 2FR-Q16) - NUMBER

(a)	$15\,400 \times 63.21$	973 434	2	M1 A1
(b)	$\frac{240}{15400} \times 100$	1.56	2	M1 A1 1.558441 Accept awrt 1.56

76 - (4MA0-W 2019-Paper 2FR-Q18) - NUMBER

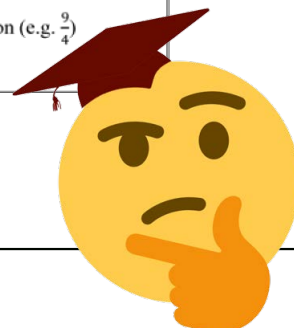
	$40 \text{ min} = \frac{40}{60} \text{ hr}$ $9720 \div 11 \frac{40}{60}$ Alt: $11 \text{ hr } 40 \text{ mins} = 11 \times 60 + 40 = 700 \text{ min}$ $9720 \div 700 \times 60$	833		M1 M1 (accept 11.66 or 11.67 or better for 11 40/60) A1 833.1428.. Accept awrt 833
		833	3	M1 M1 A1 833.1428.. Accept awrt 833

77 - (4MA0-W 2019-Paper 2FR-Q19) - NUMBER

(a)	$472 \div 20$	23.6	2	M1 A1
(b)	$10.8 \times 100 (= 1080)$ $'1080' \div 60$ Alt: $60 \div 100 = 0.6$ $10.8 \div '0.6'$	18		M1 working in cms M1 dep A1 (accept 1 : 18 or 18 : 1)
		18	3	M1 working in metres M1 dep A1 (accept 1 : 18 or 18 : 1)

78 - (4MA0-W 2019-Paper 2FR-Q22) - NUMBER

	$\frac{9}{4}$ $\frac{9}{4} \times \frac{5}{6} = \frac{45}{24}$ $\frac{45}{24} = 1 \frac{21}{24}$ or $\frac{45}{24}$ cancelled down to $\frac{15}{8}$ Alt: $\frac{9}{4}$ cancelling 9 and 6 to get $\frac{3}{4} \times \frac{5}{2} = \frac{15}{8}$			M1 converting $2 \frac{1}{4}$ into an improper fraction (e.g. $\frac{9}{4}$) M1 A1 dep M2
			3	M1 converting $2 \frac{1}{4}$ into an improper fraction (e.g. $\frac{9}{4}$) M1 A1 (dep M2)



79 - (4MA0-W 2019-Paper 2FR-Q24) - NUMBER

$120 \times 50 (= 6000)$ $120 \times \frac{3}{4} \times 80 (=7200)$ or $120 \times \frac{1}{4} \times 40$ $(=1200)$ $(\text{'7200'} + \text{'1200'} - \text{'6000'}) \div \text{'6000'} \times 100$ or $(\{\text{'7200'} + \text{'1200'}\} \div \text{'6000'} - 1) \times 100$ Alt: $120 \times 50 (= 6000)$ $120 \times \frac{3}{4} \times (80 - 50) (=2700)$ or $120 \times \frac{1}{4} \times (40 - 50) (= - 300)$ $(\text{'2700'} + \text{' - 300'}) \div \text{'6000'} \times 100$	40		M1 cost price M1 part profits M1 dep on M2 A1 M1 cost price M1 profit or loss
	40	4	M1 dep on M2 A1



1 - (4MA0-S 2015-Paper 2FR-Q16) - ALGEBRA

(a)		8
(b)	$8y = -12$ or $-8y = 12$	
		$-1\frac{1}{2}$

2 - (4MA0-S 2015-Paper 2FR-Q22) - ALGEBRA

(a)		$10p - 15$
(b)	$n^2 + 8n - 5n - 40$	
		$n^2 + 3n - 40$
(c)	$6 = (-2)^3 - k(-2) + 5$ or $6 = -8 + 2k + 5$	
	Eg $6 + 8 - 5 = 2k$ or $-2k = -8 + 5 - 6$ or $9 = 2k$ or $-9 = -2k$ or $k = \frac{(-2)^3 - 6 + 5}{-2}$ or $-k = \frac{6 - (-2)^3 - 5}{-2}$ or $-k = -4.5$	
		4.5

3 - (4MA0-W 2015-Paper 2FR-Q9) - ALGEBRA

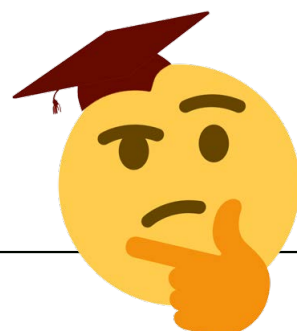
a	$6 \times 40 = 240$ $240 + 50$	
		290
b	$410 - 50 = 360$	
	$360 \div 40$	9

4 - (4MA0-W 2015-Paper 2FR-Q10) - ALGEBRA

a		$7m$
b		$5x$
c		$12y$
d	$4 \times 2 + 9$	17
e	2×3^2	18

5 - (4MA0-W 2015-Paper 2FR-Q20) - ALGEBRA

	$2y - -y = 3 - 6$ or $x + 2x = 3 + 12$	
		$x = 5, y = -1$



6 - (4MA0-S 2016-Paper 2FR-Q8) - ALGEBRA

a		$3x$	1
b		y^3	1
c		$6xy$	1
d		$8t$	1

7 - (4MA0-S 2016-Paper 2FR-Q17) - ALGEBRA

a	$4x = 13 - 5$	2	2
b	Eg $6t - 2t = 5 + 9$ or $4t = 14$ or $-4t = -14$ oe		3
		3.5	
c	$6y + 6 + 2y - 8$	$8y - 2$	2
d		$\frac{w}{2}$	2

8 - (4MA0-W 2016-Paper 2FR-Q8) - ALGEBRA

		39, 10
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9 - (4MA0-W 2016-Paper 2FR-Q15) - ALGEBRA

(a)		$4e$
(b)		$2c^2$
(c)		$5a - 4b$
(d)		$14pq$
(e)		x^9
(f)		y^6



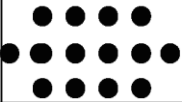
10 - (4MA0-W 2016-Paper 2FR-Q17) - ALGEBRA

(a)	$8d + 12 - 6d + 10$	$2d + 22$
(b)	$5 \times 3 + (-4)^2$ oe	31

11 - (4MA0-W 2016-Paper 2FR-Q24) - ALGEBRA

(a)	$9y - 5y = 2 + 3$ or $4y = 5$		
		25	2
(eb)	$7x - 1 = 5x$		
	eg. $7x - 5x = 1$ or $2x = 1$ or $\frac{7}{5}x - x = \frac{1}{5}$		
		$\frac{1}{2}$ oe	3

12 - (4MA0-S 2017-Paper 2FR-Q8) - ALGEBRA

(a)			1	B1
(b)	$3 \times 11 + 2$ or $3 \times 10 + 5$ oe	35	2	M1 for $3n+2$ or 5,8,11,14 ... continued for 11 items with at most 1 error or for a correct diagram drawn A1

13 - (4MA0-S 2017-Paper 2FR-Q15) - ALGEBRA

(a)		$9gh$	1	B1
(b)		$8a - 5m$	2	B2 B1 for $8a$ or $-5m$
(c)		$12 - 28c$	1	B1
(d)		$y(y + 8)$	1	B1



14 - (4MA0-S 2017-Paper 2FR-Q20) - ALGEBRA

(a)	$x^2 - 3x + 7x - 21$		2	M1	For 3 correct terms or for 4 correct terms ignoring signs or for $x^2 + 4x + c$ for any non-zero value of c or for $\dots + 4x - 21$ cao
(b)	$5p - 3p = 9$ or $2p = 9$ or $-9 = 3p - 5p$ or $-9 = -2p$	$x^2 + 4x - 21$	2	A1	oe eg $\frac{9}{2}$ or $4\frac{1}{2}$
(c)		y^{11}	1	B1	
(d)		h^8	1	B1	

15 - (4MA0-S 2017-Paper 2FR-Q21) - ALGEBRA

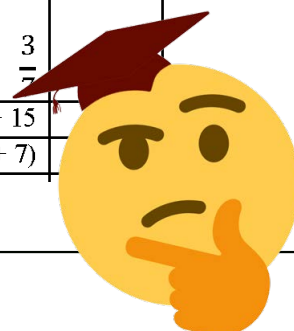
	Eg $9x = 22.5$ or $18y = 27$ or $-18y = -27$ or $5x - (13 - 4x) = 9.5$ or $4x + 5x - 9.5 = 13$ or $5\left(\frac{13-2y}{4}\right) - 2y = 9.5$ or $4\left(\frac{9.5+2y}{5}\right) + 2y = 13$		3	M1	For a complete method to eliminate one variable (condone one arithmetic error)
	Eg $5 \times "2.5" - 2y = 9.5$ or $5x - 2 \times "1.5" = 9.5$			M1	Dep on M1 For substituting the other variable or starting again to eliminate the other variable
		$x = 2.5, y = 1.5$		A1	dep on M1 NB: candidates showing no correct working score 0 marks.

16 - (4MA0-S 2017-Paper 2FR-Q23) - ALGEBRA

(a)	$4x \geq 27 - 13$ or $4x \geq 14$ or $-4x \leq 13 - 27$ or $-4x \leq -14$		2	M1	Accept an equation in place of an inequality or Accept wrong inequality sign or Accept 3.5 oe given as answer
		$x \geq 3.5$		A1	oe Must be the final answer
(b)		Correct line drawn	1	B1	For a closed circle at -1 with line that goes at least as far as 3 or For a closed circle at -1 with an arrow on a line pointing to the right
(c)		-2, -1, 0, 1, 2	2	B2	B1 for list with one error or omission: e.g. -2, -1, 0, 1, 2, 3; -1, 0, 1, 2; -2, -1, 1, 2; -3, -2, -1, 0, 1, 2 SCB1 for -3, -2, -1, 0, 1

17 - (4MA0-W 2017-Paper 2FR-Q12) - ALGEBRA

(a)		$4e + 11f$	2		
(b)	Eg $7x = 14 - 11$ or $7x = 3$				
(c)		$12p + 15$			
(d)		$2(3r + 7)$			



18 - (4MA0-W 2017-Paper 2FR-Q22) - ALGEBRA

(a)		40	2
(b)	$\frac{w^{13}}{w^4}$ OR $w \times w^8$ OR $w^5 \times w^4$	w^9	2
(c)		$3 \leq x < 9$	2

19 - (4MA0-S 2018-Paper 2FR-Q11) - ALGEBRA

(a)		$3t$	1	B1
(b)		$15pq$	1	B1
(c)		$4y - 20$	1	B1
(d)	$8x = 5 \times 9.2$ or $8x = 46$ or $\frac{x}{5} = \frac{9.2}{8}$	5.75	2	M1 Clearing fraction or dividing by 8
				A1 oe 46/8 etc

20 - (4MA0-S 2018-Paper 2FR-Q21) - ALGEBRA

	e.g. $7x = 4x - 13.5$ or $7x - 4x = -13.5$ or $7x + 13.5 = 4x$ or $4y - 7y = 54$	$x = -4.5$ $y = -18$	3	M1 For correctly eliminating y or x
	e.g. $y = 4 \times "-4.5"$ or $4x = "-18"$ or $7 \times "-4.5" - y = -13.5$			M1 dep on first M1 For method to find second variable
				A1 dep on first M1 for both answers

21 - (4MA0-S 2018-Paper 2FR-Q23) - ALGEBRA

(a)		m^{11}	1	B1
(b)		$27a^6b^{12}$	2	B2 fully correct B1 for 2 of the three terms correct in a product.
(c)	$4g - 8h + 10g - 15h$	$14g - 23h$	2	M1 Expanding brackets with 3 of 4 terms correct.
				A1 Fully correct
(d)	$y^2 - 7y + 5y - 35$	$y^2 - 2y - 35$	2	M1 Any 3 terms correct or 4 correct terms ignoring signs or $y^2 - 2y + / - \dots$ or $\dots - 2y - 35$
				A1

22 - (4MA0-S 2018-Paper 2FR-Q25) - ALGEBRA

(a)		$-3 \leq x < 4$	2	B2 B1 for one end of inequality correct ie $-3 \leq x$ or $x < 4$ or $-3 < x \leq 4$
(b)	$-5 - 3 \leq 2p < 13 - 3$ or $-5 - 3 \leq 2p$ and $2p < 13 - 3$ or $-\frac{5}{2} \leq \frac{2p+3}{2} < \frac{13}{2}$ or $-\frac{5}{2} \leq \frac{2p+3}{2}$ and $\frac{2p+3}{2} < \frac{13}{2}$	$-4 \leq p < 5$	3	M2 Correctly subtracting 3 from each part of the inequality or dividing each term by 2 or $(p =) -4$ and $(p =) 5$ M1 for one end correct e.g. $2p \geq -5 - 3$ or $\frac{2p+3}{2} < \frac{13}{2}$ or $(p =) -4$ or $(p =) 5$
				A1 accept $p \geq -4$ and $p < 5$



23 - (4MA0-W 2018-Paper 2FR-Q9) - ALGEBRA

(a)		$4e$	1	B1	
(b)		$4pq$	1	B1	
(c)		$8x + 3y$	2	B2	B1 $8x$ or $3y$
(d)		$a(4b + 7a - 1)$	2	B2	B1 for factors which, when expanded and simplified, give three terms, at least one of which is correct.

24 - (4MA0-W 2018-Paper 2FR-Q10) - ALGEBRA

(a)		9.4	1	B1	Accept $\frac{47}{5}$
(b)		21	1	B1	
(c)(i)		1384.5841	1	B1	Accept 1384(5841) rounded or truncated
(ii)		1400	1	B1	Ft if (i) at least 3SF

25 - (4MA0-W 2018-Paper 2FR-Q19) - ALGEBRA

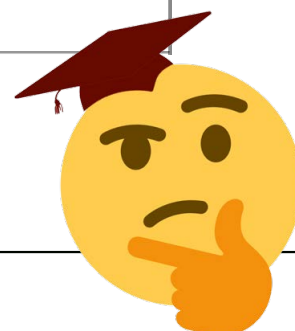
(a)	$4 > 11 + 8p$ or $-8p > 11 - 4$ or $-8p > 7$ or $8p < 4 - 11$ or $8p < -7$	$p < \frac{-7}{8}$	2	M1	Accept $4 = 11 + 8p$ or $-8p = 11 - 4$ or $\frac{-7}{8}$ or $8p = 4 -$
(b)	$x^2 + 3x - 6x - 18$	$x^2 - 3x - 18$	2	M1	11 Condone $p < -0.875$ Mark the final answer For 3 correct terms or For 4 correct terms ignoring signs or For $x^2 - 3x + c$ for any non-zero value of c or For ... $- 3x - 18$
(c)		y^8	1	A1	
(d)		$9e^2$	2	B1	
(e)		3	2	M1	B1 for 9 or e^2 as part of a product or for $3^2 \times e^2$ For 2^{11-2-3} or 2^6 or 64 or 4^3 or 2^{2n}
				A1	Accept 4^3

26 - (4MA0-W 2019-Paper 2FR-Q8) - ALGEBRA

(a)		Correct pattern	1	B1	
(b)		21	1	B1	
(c)		20	1	B1	
(d)	$30 + 29$	59	2	M1	
				A1	

27 - (4MA0-W 2019-Paper 2FR-Q10) - ALGEBRA

(a)	$y = 2 \times 3 \times 4 - 8$	16	2	M1	
		16	2	A1	
(b)	$y = 2c \times 2 + 3c = 4c + 3c$	$7c$	2	M1 for $4c$	
				A1	



28 - (4MA0-W 2019-Paper 2FR-Q20) - ALGEBRA

(a)	$5x - x = 8 + 2$			M2 collecting x terms on one side and all numbers on the other side (accept $4x = 10$) (M1 for collecting x terms on one side or all numbers on one side e.g. $6x = 8 + 2$ or $4x = 8 - 2$) A1 oe dep on at least M1 Accept $x = 10/4$ or $5/2$
(b)		2.5	3	
(c)		$t(3 - 5y)$	1	B1
(d)		k^6	1	B1
	$\frac{h}{2} < 5 + 8$ or $2 \times \frac{h}{2} - 2 \times 8 < 2 \times 5$			M1 for a correct first step (accept use of $=$)
		$h < 26$	2	A1 cao



1 - (4MA0-W 2015-Paper 2FR-Q16) - FUNCTIONS & GRAPHS

		A $x = 3$ B $y = -2$ C $y = -x$
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2 - (4MA0-W 2015-Paper 2FR-Q17) - FUNCTIONS & GRAPHS

	$600 \times 67.1 (= 40260)$ or $67.1 \div 82.5 (= 0.813...)$	
	"40260" $\div 82.5$ or "0.813.." $\times 600$	
		488

3 - (4MA0-S 2016-Paper 2FR-Q20) - FUNCTIONS & GRAPHS

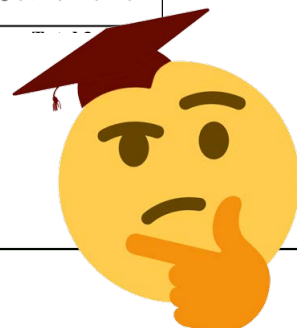
a		7, -1, -2, 7	2
b		Correct curve	2
c		4.4 – 4.5	1

4 - (4MA0-W 2016-Paper 2FR-Q12) - FUNCTIONS & GRAPHS

(a)		80
(b)		56
(c)		880

5 - (4MA0-S 2017-Paper 2FR-Q13) - FUNCTIONS & GRAPHS

	$(-2, -5) (-1, -3) (0, -1) (1, 1) (2, 3) (3, 5)$	Correct line between $x = -2$ and $x = 3$	3	B3 For a correct line between $x = -2$ and $x = 3$ B2 For a correct line through at least 3 of $(-2, -5) (-1, -3) (0, -1) (1, 1) (2, 3) (3, 5)$ or For all of $(-2, -5) (-1, -3) (0, -1) (1, 1) (2, 3) (3, 5)$ plotted but not joined. B1 For at least 2 correct points stated (may be in a table) or For a line drawn with a positive gradient through $(0, -1)$ or For a line with the correct gradient. NB a line joining $(0, -1)$ to $(2, 0)$ scores B0
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6 - (4MA0-W 2018-Paper 2FR-Q4) - FUNCTIONS & GRAPHS

(a)		39	1	B1	
(b)		- 17	1	B1	
(c)		22	1	B1	
(d)		$4x + 15$	1	B1	Oe Eg. $x \times 4 + 15$
(e)		$\frac{y-15}{4}$ oe	2	M1 A1	For a correct inverse operation

7 - (4MA0-W 2018-Paper 2FR-Q5) - FUNCTIONS & GRAPHS

(a)		(5, 6)	1	B1	
(b)		$\times$ at (5, 0)	1	B1	
(c)	$\left(\frac{1+5}{2}, \frac{2+6}{2}\right)$	(3, 4)	2	M1 A1	For correct x-coordinate or correct y-coordinate SCB1 for (4, 3)

8 - (4MA0-W 2019-Paper 2FR-Q2) - FUNCTIONS & GRAPHS

(a)		(7, 5)	1	B1	
(b)		C marked in correct position	1	B1	
(c)	'D' marked on the grid at (5, -3)	(5, -3)	2	M1 ft (b) A1 ft (b)	A single point at (5, -3) will suffice

9 - (4MA0-W 2019-Paper 2FR-Q15) - FUNCTIONS & GRAPHS

(a)	$106 - 4$ or $101 - 12$	$g = 102$ $h = 89$	2	M1 A1 both correct	
(b)	$y + 110 = 130$	(110, 20)	2	M1 or $130 - 110$ A1 both correct	



1 - (4MA0-S 2015-Paper 2FR-Q24) - MENSURATION

	$2\pi \times 3.5 \times 8.2 + 2\pi \times 3.5^2$ or $57.4\pi + 24.5\pi$ or 81.9π or $180(.327..)+76.9(690...)$ or $2\pi \times 3.5 \times 8.2 + \pi \times 3.5^2$ or $180(.327..)+38.4(845...)$ or $218(.81....)$	
		257

2 - (4MA0-W 2015-Paper 2FR-Q14) - MENSURATION

a	$8 \times 5 \times 50$	
		2000
b	$12.5 \times 25 = 312.5$	
	$2000 \div 312.5$	
		6.4

3 - (4MA0-S 2016-Paper 2FR-Q9) - MENSURATION

a		24	1
b	$4 + 6 + 4 + 6 + (6 - 4) + 4 + 6$ or $2 \times (4 + 6 + 4 + 6) - 2 \times 4$ oe	32	2

4 - (4MA0-S 2016-Paper 2FR-Q22) - MENSURATION

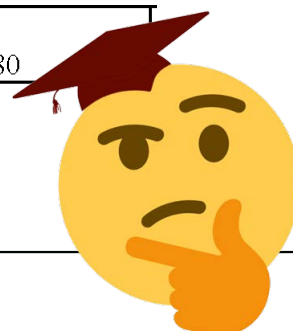
$\pi \times 3^2 (= 9\pi = 28.(27..))$ or $\pi \times (3+2)^2 (= 25\pi = 78.(53..))$		3
$\pi \times 5^2 - \pi \times 3^2$ oe eg 16π		
	50.3	

5 - (4MA0-W 2016-Paper 2FR-Q10) - MENSURATION

(a)		15
(b)		10
(c)		7

6 - (4MA0-W 2016-Paper 2FR-Q14) - MENSURATION

	$10 \times 4 \times 7$	280
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7 - (4MA0-W 2016-Paper 2FR-Q18) - MENSURATION

	$48 \div 8 (=6)$	
	$(8 + "6") \times 2 (=28)$	
	$"28" \div 4 (=7)$	
		49

8 - (4MA0-S 2017-Paper 2FR-Q9) - MENSURATION

		35	2	M1	7×5 oe or 7×6 or 42
				A1	35

9 - (4MA0-S 2017-Paper 2FR-Q16) - MENSURATION

	$10 \times 4.2 \times 7.5$ or $315 \text{ (cm}^3\text{)} \text{ oe}$ Eg $0.5 \times 7 \times x \times 5$ or $17.5x$ oe		4	M1	For volume of cuboid
	$10 \times 4.2 \times 7.5 = 0.5 \times 7 \times x \times 5$ or $17.5x = 315$ oe or $\frac{10 \times 4.2 \times 7.5}{0.5 \times 7 \times 5}$ or "315" oe			M1	indep For volume of triangular prism
		18		M1	Dep on M2 For a correct equation involving volume of cuboid and volume of prism or For a correct expression for x
				A1	18 SCB2 for For volume of cuboid = 315 and final answer = 9

10 - (4MA0-W 2017-Paper 2FR-Q14) - MENSURATION

$\frac{4}{2} (6 + 10)$	32	2
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11 - (4MA0-W 2017-Paper 2FR-Q15) - MENSURATION, GEOMETRY

$24 \div 8$ or 3 or $35 \div 7$ or 5 or $66 \div 11$ or 6 or $8 \times 7 \times 11$ or 616 or $24 \times 35 \times 66$ or 55440		
$"3" \times "5" \times "6"$ or $"55440" \div "616"$	90	3



12 - (4MA0-W 2017-Paper 2FR-Q19) - MENSURATION

30×20 or 600	399	4
$\pi \times 8^2$ or 201.(0619298...) or 64π		
$30 \times 20 - \pi \times 8^2$		

13 - (4MA0-W 2018-Paper 2FR-Q18) - MENSURATION

(a)	Eg 3×6 or 18 or 3×4 or 12 or 8×2 or 16 or 5×2 or 10 or 8×6 or 48 or 4×5 or 20	28	3	M1 For method to find the area of a rectangle
(b)	Eg $3 \times 6 + 5 \times 2$ or $3 \times 4 + 8 \times 2$ or $8 \times 6 - 4 \times 5$ $\frac{350}{28}$ or " 28 " $\times h = 350$	12.5	2	M1 Complete method A1 M1ft A1ft

14 - (4MA0-W 2019-Paper 2FR-Q11) - MENSURATION

$24 \times w = 432$	18	2	M1 or $432 \div 24$ A1
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15 - (4MA0-W 2019-Paper 2FR-Q17) - MENSURATION

$\sqrt{400} = 20$ $\pi \times 20^2$ oe	62.8	3	M1 M1 dep A1 62.83185 ... Accept awrt 62.8
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16 - (4MA0-W 2019-Paper 2FR-Q23) - MENSURATION

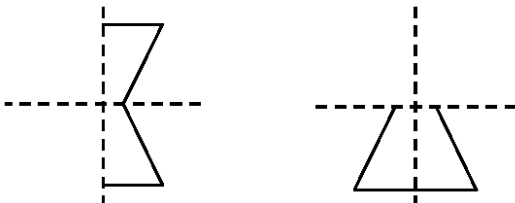
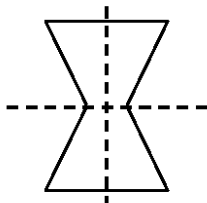
$6 \times 12 (=72)$ or $0.5 \times 7 \times 4 (=14)$ or $6 \times 5 (=30)$ or $7 \times 6 (=42)$ $0.5 \times \{6+10\} \times 7 (=56)$ ' 30 ' + ' 42 ' + ' 14 ' or ' 72 ' + ' 14 ' or ' 30 ' + ' 56 ' ' 86 ' $\times 25$ Alt: $6 \times 12 \times 25 (=1800)$ or $0.5 \times 7 \times 4 \times 25 (=350)$ or $6 \times 5 \times 25 (=750)$ or $7 \times 6 \times 25 (=1050)$ or $0.5 \times \{6+10\} \times 7 (=1400)$ ' 1800 ' + ' 350 ' or ' 750 ' + ' 1400 ' or ' 750 ' + ' 1050 ' + ' 350 '	2150	4	M1 for any correct calculation of a component of the cross-section (i.e. leading to 72 or 14 or 30 or 56 or 42) M1 dep correct cross-section components added to get total cross section (=86) M1 (dep on previous M1) A1 cao M1 for any correct calculation seen of one volume block (i.e. leading to 1800 or 350 or 750 or 1050 or 1400) (M2 for any two correct volume calculations seen) M1 (dep on previous M2) correct volume components selected to be added A1
	2150		



1 - (4MA0-S 2015-Paper 2FR-Q3) - *GEOMETRY*

(a)		tangent at B
(b)		any reflex angle marked
(c)		radius
(d)		segment shaded

2 - (4MA0-S 2015-Paper 2FR-Q10) - *GEOMETRY*

3 - (4MA0-S 2015-Paper 2FR-Q13) - *GEOMETRY*

	Line from P at 60° to base (2° tolerance) or arc from Q of length 7.3 cm (2 mm tolerance)	
		correct triangle



4 - (4MA0-S 2015-Paper 2FR-Q18) - GEOMETRY

(a) (i)		correct line
(a) (ii)		correct line
(a) (iii)	$(-2, -4), (-1, -1), (0, 2), (1, 5), (2, 8), (3, 11)$	correct line drawn from between $x = -2$ and $x = 3$

(b)		
		correct point



5 - (4MA0-W 2015-Paper 2FR-Q3) - GEOMETRY

ai		acute
aii		60
b		R placed correctly

6 - (4MA0-W 2015-Paper 2FR-Q4) - GEOMETRY

		Correct circle
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7 - (4MA0-W 2015-Paper 2FR-Q18) - GEOMETRY

a	$\pi \times 150$ oe	
		471
b	$30 \times 60 (=1800)$ or “471” $\div 30 (=15.7)$	
	“471” $\div$ ”1800” or “15.7” $\div 60$	
		0.262
c	Radius = $x - h$ or $\frac{D}{2} = x - h$ oe	
		$h = x - \frac{D}{2}$ oe

8 - (4MA0-W 2015-Paper 2FR-Q19) - GEOMETRY

	Angle $DAB = 110$	
	Angle $BAX = 110 \div 2 (= 55)$ or Angle $DAX = 110 \div 2 (= 55)$ or Angle $AXD = 55$	
	Angle $AXD = 55$ or Angle $CBA = 180 - 110 (=70)$ or Angle $ADC = 180 - 110 (=70)$	
		125



9 - (4MA0-W 2015-Paper 2FR-Q23) - GEOMETRY

a	$\frac{1}{2}(14 + 20) \times 8$ or $8 \times 14 + \frac{1}{2} \times 6 \times 8$	
		136
b	$20 - 14 (= 6)$	
	$6^2 + 8^2$ or $36 + 64$ or 100	
	$\sqrt{6^2 + 8^2}$	
		10

10 - (4MA0-S 2016-Paper 2FR-Q1) - GEOMETRY

ai		(3, 4)	1
aii		(-5, 1)	1
b	$5 \times 3 + 3 + 0.5 + 0.5 + 0.5$ or $5 \times 3 + 0.5 \times 3 \times 3$ oe	19.5	2

11 - (4MA0-S 2016-Paper 2FR-Q3) - GEOMETRY

a		R marked	1
b		60°	1
c		7 or 70 cm or mm	2

12 - (4MA0-S 2016-Paper 2FR-Q10) - GEOMETRY

Angle ACB or ABC or $BAC = 60^\circ$ $180^\circ - 90^\circ - 60^\circ$ or $180^\circ - 120^\circ - 30^\circ$	30	3
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13 - (4MA0-S 2016-Paper 2FR-Q19) - *GEOMETRY*

a	$360 - 2 \times 111 - 90$	48	2
b	$111 - 90$	21	2
c	$540 - 90 - 90 - 111 - 111$ or $180 - 2 \times '21'$ or $2 \times (180 - 111)$ or $360 - 111 = 249$ $180 - (360 - '21' - 249 - 48)$ oe	138	3

14 - (4MA0-W 2016-Paper 2FR-Q4) - *GEOMETRY*

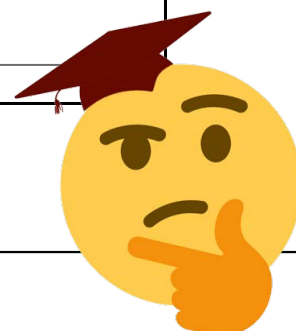
(a)		65
(b)		115
(c)		obtuse

15 - (4MA0-W 2016-Paper 2FR-Q6) - *GEOMETRY*

(a)		B or F
(b)		1/one
(c)		12
(d)		A & C

16 - (4MA0-W 2016-Paper 2FR-Q23) - *GEOMETRY*

(a) (i)		57
(ii)		<u>Corresponding</u> angles
(b)	$(5 - 2) \times 180$ or 3×180 or $(2 \times 5 - 4) \times 90$ or 6×90 or $360 + 180$ or 540 $'540' - (86 + 142 + 72 + 115)$ oe	
		125
	Alternative method (exterior angles) $360 - ('94' + '38' + '108' + '65') (=55)$ or $360 - 305 (=55)$ $180 - '55'$	
		125



23 - (4MA0-W 2017-Paper 2FR-Q21) - GEOMETRY

$12.8^2 - 9.7^2$ or $163.84 - 94.09$ or 69.75	8.35	3
$\sqrt{12.8^2 - 9.7^2}$		

24 - (4MA0-W 2017-Paper 2FR-Q23) - GEOMETRY

$160 - 3x + 7x - 20 = 180$ or $2(160 - 3x) + 2(7x - 20) = 360$ oe	10	3
e.g. $4x = 180 - 140$ or $-3x + 7x = 180 + 20 - 160$ or $4x = 40$ or $14x - 6x = 360 - 320 + 40$ oe		

25 - (4MA0-S 2018-Paper 2FR-Q3) - GEOMETRY

(i)		tangent	1	B1	Condone incorrect spelling if meaning clear.
(ii)		radius	1	B1	Condone incorrect spelling if meaning clear.
(iii)		chord	1	B1	Condone incorrect spelling if meaning clear.

26 - (4MA0-S 2018-Paper 2FR-Q12) - GEOMETRY

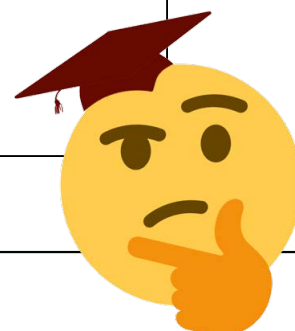
(a)	$0.5 \times (22 + 25) \times 12$ oe	282	2	M1	Correctly substituting values into formula for area of trapezium
				A1	

27 - (4MA0-S 2018-Paper 2FR-Q17) - GEOMETRY

(a)(i)		67	1	B1	
(ii)		<u>reason</u>	1	B1	dep on B1 or a fully correct method shown in (i) e.g. <u>alternate angles</u> are equal or other fully correct method
(b)	e.g. $180 - (67 + 60)$ or $120 - 67$ or $(180 - 67) - (180 - 120)$ or $113 - 60$ or $180 - 67 = 60 + y$ or $113 = 60 + y$ or $120 - y = 67$	53	2	M1	Correct calculation for y or correct equation in y , or $BFC = 60^\circ$ and $BCF = 67^\circ$ or $ABF = 60^\circ$ and $BCF = 67^\circ$ or $ABF = 60^\circ$ and $ABC = 113^\circ$
				A1	

28 - (4MA0-W 2018-Paper 2FR-Q3) - GEOMETRY

(a)(i)		Isosceles	1	B1	
(a)(ii)		Line of symmetry correctly drawn	1	B1	
(b)		2	1	B1	
(c)(i)		Octagon	1	B1	
(ii)	8×2	16	2	M1	
				A1	



29 - (4MA0-W 2019-Paper 2FR-Q4) - *GEOMETRY*

(a)		radius	1	B1
(b)		chord	1	B1
(c)		sector	1	B1
(d)		12	1	B1

30 - (4MA0-W 2019-Paper 2FR-Q7) - *GEOMETRY*

(a)	Angle PRQ drawn 55° or QR drawn 6 cm long	Fully correct		M1 Angle $R \pm 2^\circ$, $QR \pm 0.2$ cm A1
(b)		60°	1	B1 58° to 62° inclusive
(c)		D placed correctly	1	B1 D 3 cm from $A \pm 0.2$ cm

31 - (4MA0-W 2019-Paper 2FR-Q12) - *GEOMETRY*

(a)	$x + 90 + 90 + 40 = 360$	140	2	M1 or $360 - (90 + 90 + 40)$ A1
(b)		140	1	B1

32 - (4MA0-W 2019-Paper 2FR-Q21) - *GEOMETRY*

	$9^2 - 6^2 (=45)$ $\sqrt{(9^2 - 6^2)} (= \sqrt{45})$	6.71	3	M1 or $9^2 = h^2 + 6^2$ or for a complete method to find an unknown angle, x (correct to 1 d.p) in the triangle e.g. $\cos^{-1}(6/9) (= 48.2^\circ)$ or $\sin^{-1}(6/9) (= 41.8^\circ)$ M1 for a complete method, using x , to find h e.g $6 \times \tan 48.2^\circ$ A1 or awrt 6.71
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1 - (4MA0-S 2015-Paper 2FR-Q20) - TRIGONOMETRY

	$\cos 56^\circ = \frac{7.4}{x}$ or $7.4 = x \cos 56$ or $\sin(90 - 56) = \frac{7.4}{x}$ or $7.4 = x \sin(90 - 56)$	
	$(x =) \frac{7.4}{\cos 56}$ or $\frac{7.4}{\sin(90 - 56)}$	
		13.2

2 - (4MA0-W 2015-Paper 2FR-Q12) - TRIGONOMETRY

a		Rectangle with 8 squares
b		Isosceles triangle with 8 cm^2

3 - (4MA0-S 2017-Paper 2FR-Q10) - TRIGONOMETRY

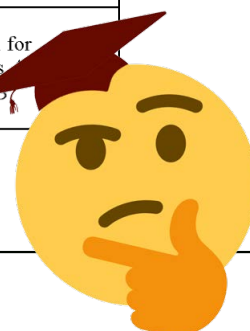
(a)		$123^\circ - 127^\circ$	1	B1
(b)	Bearing of 070° from B and 7 cm from B	Correct angle and length	2	B1 Correct bearing within overlay B1 A point 7cm from B. Accept 6.8cm - 7.2cm

4 - (4MA0-W 2017-Paper 2FR-Q24) - NUMBER, TRIGONOMETRY

(a)	$\cos x = \frac{60}{110}$ or $\cos x = 0.545(4545\dots)$		3
	$(x =) \cos^{-1}\left(\frac{60}{110}\right)$		
		56.9	
(b)	$90 - 56.9(4426885\dots)$ oe	033	2
(c)(i)		105	2
(c)(ii)		115	

5 - (4MA0-S 2018-Paper 2FR-Q22) - TRIGONOMETRY

	$\cos A = \frac{43}{70} (=0.6142)$ or $\sin B = \frac{43}{70} (=0.6142)$	142	4	M1	$\cos B = \frac{55.23\dots}{70}$, $\sin A = \frac{55.23\dots}{70}$
	$A = \cos^{-1}\left(\frac{43}{70}\right)$ or $B = \sin^{-1}\left(\frac{43}{70}\right)$			M1	$A = \sin^{-1}(0.7890\dots)$ $B = \cos^{-1}(0.7890\dots)$
	$A = 52.1^\circ$ or $B = 37.9^\circ$			A1	$52^\circ - 52.1^\circ$ or $37.9^\circ - 38^\circ$ SC B1 If M0 M0 A0 award B1 for 52.1° or 37.9° not identified as
				B1 ft	for an angle identified as A or B Correct bearing (142 – 142.1)



6 - (4MA0-W 2018-Paper 2FR-Q17) - TRIGONOMETRY

	$\text{Eg } \sin 20 = \frac{BC}{8.4} \text{ or } \frac{BC}{\sin 20} = \frac{8.4}{\sin 90} \text{ or } \frac{\sin 20}{BC} = \frac{\sin 90}{8.4}$ $8.4 \sin 20 \text{ or } \frac{8.4}{\sin 90} \times \sin 20 \text{ or } 8.4 \cos 70$	2.87	3	M1 Or for AC or angle B evaluated correctly AND then used in a correct method to find BC Eg $BC^2 + (7.89(34\dots))^2 = 8.4^2$ or Eg $\tan 20 = \frac{BC}{7.89(34\dots)}$ M1 A1 For a complete method Accept 2.87(296...) rounded or truncated to at least 3 SF
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1 - (4MA0-S 2015-Paper 2FR-Q11) - SETS

(i)		{i, a}
(ii)		{c, h, i, n, a, t, l, y}

2 - (4MA0-W 2015-Paper 2FR-Q24) - SETS

a		3, 6, 9
b		{2,3,4,6,8,9,10}
c		{6}
d		3, 9

3 - (4MA0-W 2016-Paper 2FR-Q25) - SETS

		5, 10, 20, 25, 50, 100
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4 - (4MA0-S 2017-Paper 2FR-Q18) - SETS

(a) (i)		5, 15	1	B1
(ii)		5, 7, 9, 10, 11, 13, 15	1	B1
(b)		4, 6, 8, 10, 12, 14	2	B2 B2 for all correct and none incorrect. If not B2 then B1 for 4 or more correct and no more than 1 incorrect.

5 - (4MA0-W 2017-Paper 2FR-Q18) - SETS

(i)		3, 5, 7	1
(ii)		1, 2, 3, 5, 7, 9	1

6 - (4MA0-W 2019-Paper 2FR-Q25) - SETS

(a)		1,3,5,7,8,9,10	1	B1
(b)		3, 9	1	B1
(c)		e.g. 1,2,4,5	2	B2 any set of 4 elements , one of which is 5 and the other three are from {1, 2, 3, 4, 6} (no repeats) If not B2 then B1 for either any set of 4 elements, from {1, 2, 3, 4, 6}(no repeats) or 5 and the other three are from {6, 7, 8, 9, 10} (no repeats)



1 - (4MA0-S 2015-Paper 2FR-Q4) - STATISTICS

(a)	Attempt to show tallies (correct for at least one of the scores).	
		4, 5, 2, 3, 3, 3
(b)		2
(c)		5
(d)		Unlikely

2 - (4MA0-S 2015-Paper 2FR-Q5) - STATISTICS

(a)		isosceles
(b)		A, E
(c)(i)		correct cross
(c) (ii)		180

3 - (4MA0-S 2015-Paper 2FR-Q9) - STATISTICS

	$\frac{8+3+1+7+6+5}{6}$ or $\frac{30}{6}$	
		5

4 - (4MA0-S 2015-Paper 2FR-Q17) - STATISTICS

	$\frac{4+9+7+1+6+3}{2}$ or $\frac{(4+9+7+1+6+3)+1}{2}$	
	or $\frac{30}{2}$ or $\frac{31}{2}$ or 15 or $15\frac{1}{2}$	
		2

5 - (4MA0-W 2015-Paper 2FR-Q1) - STATISTICS

a		16
b		20
	$20 + 10 = 30$	3 full eggs and three quarters
c		



6 - (4MA0-W 2015-Paper 2FR-Q22) - STATISTICS

	$3 \times 8 + 8 \times 10 + 13 \times 18 + 18 \times 20 + 23 \times 10 + 28 \times 4$ or $24 + 80 + 234 + 360 + 230 + 112$ or 1040	
	$\frac{3 \times 8 + 8 \times 10 + 13 \times 18 + 18 \times 20 + 23 \times 10 + 28 \times 4}{8 + 10 + 18 + 20 + 10 + 4}$ or “1040” $\div (8 + 10 + 18 + 20 + 10 + 4)$	
		14.9

7 - (4MA0-S 2016-Paper 2FR-Q11) - STATISTICS

a	$4 - 0.8$	3.2	2
b	$1400000 \times 60 \div 100$	840 000	2
c	$\frac{0.6}{4}$	$\frac{3}{20}$	2

8 - (4MA0-S 2016-Paper 2FR-Q21) - STATISTICS

	$x = 10$	3
$3 + 6 + x + y = 4 \times 11$ oe		
	$y = 25$	

9 - (4MA0-W 2016-Paper 2FR-Q5) - STATISTICS

(a)		36
(b)	$22 - 8$ or 22 and 8	14
	(c)	$1\frac{3}{4}$ circles drawn



10 - (4MA0-W 2016-Paper 2FR-Q20) - STATISTICS

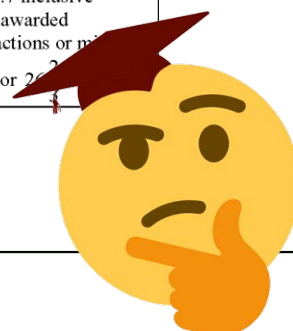
(a)		15 - 19
(b)	$2 \times 1 + 7 \times 5 + 12 \times 6 + 17 \times 10 + 22 \times 8$ or $2 + 35 + 72 + 170 + 176$ or 455	
	$\frac{2 \times 1 + 7 \times 5 + 12 \times 6 + 17 \times 10 + 22 \times 8}{30}$ or “455” $\div 30$	
		15.2

11 - (4MA0-S 2017-Paper 2FR-Q2) - STATISTICS

(a)		Football	1	B1
(b)		20	1	B1
(c)		Correct bar	1	B1 Bar for boys at 40 for basketball
(d)		5 : 7	2	M1 25 : 35 A1 Allow 1 : 1.4 or 0.71(428...): 1 or $\frac{5}{7}$:1 SCB1 for 7:5 or 1.4:1 or $1:\frac{5}{7}$ or or 1:0.71(428.....)

12 - (4MA0-S 2017-Paper 2FR-Q22) - STATISTICS

(a)		$30 < d \leq 40$	1	B1 Accept 30 – 40
(b)	$5 \times 5 + 15 \times 12 + 25 \times 17 + 35 \times 20 + 45 \times 6$ or $25 + 180 + 425 + 700 + 270$ or 1600	26.7	4	M2 $f \times d$ for at least 4 products with correct mid- interval values and intention to add. If not M2 then award M1 for d used consistently for at least 4 products within interval (including end points) and intention to add or for at least 4 correct products with correct mid-interval values with no intention to add
	$\frac{25+180+425+700+270}{5+12+17+20+6}$ or $\left(= \frac{1600}{60} \right)$			M1 dep on M1 (ft their products) NB: accept their 60 if addition of frequencies is shown
				A1 Accept 26.6 – 26.7 inclusive Accept 27 if M3 awarded Do not accept fractions or mixed numbers, eg $\frac{80}{3}$ or $26\frac{2}{3}$



13 - (4MA0-W 2017-Paper 2FR-Q2) - STATISTICS

(a)		16	1
(b)		12	1
(c)		$2\frac{3}{4}$ blocks drawn	2

14 - (4MA0-W 2017-Paper 2FR-Q7) - STATISTICS

(a)		January	1
(b)	13 -- 2	15	2
(c)	$-4 + 28$ or $28 - 4$	24	2

15 - (4MA0-W 2017-Paper 2FR-Q8) - STATISTICS

(a)	$224 - 14$	210	1
(b)	Numbers in order 14, 160, 166, 190, 192, 224	178	2
(c)		Correct explanation	1

16 - (4MA0-S 2018-Paper 2FR-Q5) - STATISTICS

(a)		3, 7, 5, 3, 2	2	B2	For all correct frequencies B1 for 3 or 4 correct frequencies or at least 3 correct tallies
(b)		1	1	B1ft	From table
(c)		$\frac{3}{20}$	1	B1ft	From table oe

17 - (4MA0-S 2018-Paper 2FR-Q10) - STATISTICS

(a)	$\frac{360}{240} (=1.5)$ oe or $\frac{38}{240}$	57	2	M1	For a correct method to find angle for 1 throw or fraction of full circle
				A1	
(b)	$\frac{250}{100} \times 360$ oe or $60 \times 2.5 + 80 \times 2.5 + 250 + 70 \times 2.5 + 50 \times 2.5$ ($= 150 + 200 + 250 + 175 + 125$)	900	2	M1	For a correct method to find number of spins
				A1	



18 - (4MA0-S 2018-Paper 2FR-Q16) - STATISTICS

		2 , 20, 29	3	M2 for 3 number selected with at least two of the properties: mean = 17, median = 20, range = 27 else M1 with one of these properties
				A1 in any order
Alternative				
	$17 \times 3 (= 51)$	2 , 20, 29	3	M1 method to find sum of 3 numbers
	$17 \times 3 - 20 (=31)$			M1 method to find sum of smallest and largest numbers
				A1 in any order
Alternative				
	$x, 20, z$ or x, y, z and $y = 20$	2 , 20, 29	3	M1 use of different letters with 20 shown as the middle value
	$x + z = 31$ or $\frac{x + 20 + z}{3} = 17$ oe or $z - x = 27$ or $x - z = 27$			M1 an equation for the sum or for the difference of the two unknown numbers
				A1 in any order

19 - (4MA0-S 2018-Paper 2FR-Q18) - STATISTICS

	$(0 \times 2) + 1 \times 7 + 2 \times 3 + 3 \times 4 + 4 \times 3 + 5 \times 1$ $(0 +) 7 + 6 + 12 + 12 + 5$	42	2	M1 For at least 4 correct products seen with the intention to add.
				A1 SC B1 for 2.1

20 - (4MA0-W 2018-Paper 2FR-Q1) - STATISTICS

(a)		32	1	B1
(b)		28	1	B1
(c)	18 + 12 or 30	$3\frac{3}{4}$ rugby balls	2	M1 For 18 + 12 or 30 A1

21 - (4MA0-W 2018-Paper 2FR-Q16) - STATISTICS

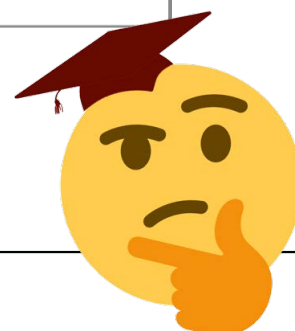
(a)		3	1	B1
(b)	$0 \times 1, 1 \times 8, 2 \times 12, 3 \times 15, 4 \times 4$ or 0, 8, 24, 45, 16	93	2	M1 For at least 4 products (may not be evaluated. A1 SCB1 for 94
(c)	$\frac{15}{40} + \frac{4}{40}$ oe	$\frac{19}{40}$	2	M1 A1 oe Eg 0.475 SCB1 for $\frac{31}{40}$ or 0.775

22 - (4MA0-W 2019-Paper 2FR-Q1) - STATISTICS

(a)		24	1	B1
(b)		9	1	B1
(c)		2 circles and a half circle	1	B1 oe

23 - (4MA0-W 2019-Paper 2FR-Q6) - STATISTICS

(a)	$(330 + 330 + 250 + 290 + 350 + 330 + 310 + 370 + 320 + 300) (= 3180) \div 10$	318	2	M1
(b)	250 290 300 310 320 330 330 330 350 370	325	2	A1 M1 write in order
(c)		330	1	A1 B1
(d)	$370 - 250$ or $250 - 370$	120	2	M1 for identification of 250 and 370 A1



1 - (4MA0-S 2015-Paper 2FR-Q14) - PROBABILITY

(a)		$\frac{5}{12}$
(b)		$\frac{4}{12}$
(c)	$1 - \frac{19}{36}$	
		$\frac{17}{36}$

2 - (4MA0-S 2015-Paper 2FR-Q23) - PROBABILITY

(a)	$1 - 0.44 - 0.42 - 0.04$	
		0.1 oe
(b)		0.86 oe
(c)	1200×0.04	
		48

3 - (4MA0-W 2015-Paper 2FR-Q7) - PROBABILITY

ai		Marked at 0.5
aii		Marked at 0
b		Likely

4 - (4MA0-W 2015-Paper 2FR-Q11) - PROBABILITY

a	B A	1	2	3	4		Correct table
	1	2	3	4	5		
	2	3	4	5	6		
	3	4	5	6	7		
	4	5	6	7	8		
b							
						$\frac{3}{16}$ oe	
c							
						$\frac{6}{16}$ oe	



5 - (4MA0-S 2016-Paper 2FR-Q4) - PROBABILITY

i		X at $\frac{1}{2}$ on scale	1
ii		X at 0 on scale	1
iii		X to the right of 0 and to the left of 0.25 on scale	1

6 - (4MA0-W 2016-Paper 2FR-Q7) - PROBABILITY

(i)		Cross labelled E at 0.5
(ii)		Cross labelled F at $\frac{1}{2}$
(iii)		Cross labelled G at 1

7 - (4MA0-W 2016-Paper 2FR-Q11) - PROBABILITY

(a)		$\frac{7}{15}$
(b)		0
(c)		$\frac{12}{15}$

8 - (4MA0-S 2017-Paper 2FR-Q4) - PROBABILITY

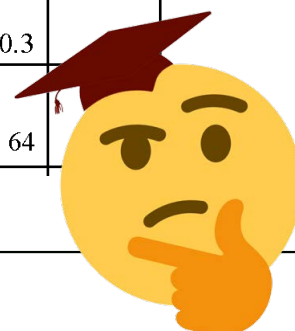
(a)		1	1	B1	1, 1.0, 100%
(b)		0.3	1	B1	oe

9 - (4MA0-S 2017-Paper 2FR-Q14) - PROBABILITY

(a)			1	2	3	4	5	6	2	B2 B1	All entries correct or 5 correct entries
		1	0	1	2	3	4	5			
		2	1	0	1	2	3	4			
		3	2	1	0	1	2	3			
(b) (i)		$\frac{1}{18}$						1	B1ft	From complete table Accept 0.055(555...) rounded or truncated to at least 3 dp	
(ii)		$\frac{6}{18}$						1	B1ft oe	From complete table Eg $\frac{1}{3}$ Accept 0.33(333...) rounded to at least 2 dp	

10 - (4MA0-W 2017-Paper 2FR-Q17) - PROBABILITY

(a)	$1 - 0.15$	0.85	2
(b)		0.55	1
(c)	$\frac{1 - (0.15 + 0.4)}{3}$ or $\frac{0.45}{3} (= 0.15)$		
		0.3	
(d)	160×0.4	64	



11 - (4MA0-S 2018-Paper 2FR-Q8) - PROBABILITY

(i)		B	1	B1 Accept $\frac{3}{12}$ oe
(ii)		E	1	B1 Accept $\frac{9}{12}$ oe
(iii)		F	1	B1 Accept 1
(iv)		A	1	B1 Accept 0

12 - (4MA0-W 2018-Paper 2FR-Q11) - PROBABILITY

(a)(i)		$\times$ at 0	1	B1
(ii)		$\times$ at $\frac{2}{4}$	1	B1
(b)		Correct table	2	M1 For 3 correct entries A1
(c)		$\frac{6}{16}$ oe	2	M1ft For $\frac{6}{a}$ where $6 \leq a \leq 16$ or A1ft For $\frac{b}{16}$ where $1 \leq b \leq 16$ where a and b are integers

13 - (4MA0-W 2019-Paper 2FR-Q5) - PROBABILITY

(a)		Marked 2/6 in from left	1	B1
(b)		Marked at 0	1	B1
(c)		unlikely	1	B1

14 - (4MA0-W 2019-Paper 2FR-Q13) - PROBABILITY

(a)		$\frac{3}{8}$	1	B1 oe
(b)		$\frac{5}{8}$	1	B1 oe
(c)		$\frac{1}{8}$	1	B1 oe



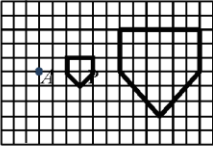
1 - (4MA0-S 2016-Paper 2FR-Q5) - TRANSFORMATION

a		A and D	1
b		C	1
c		E	1

2 - (4MA0-S 2016-Paper 2FR-Q15) - TRANSFORMATION

a		Vertices at (3,5)(7,5)(7,7)(5,7)	2
b		<u>Enlargement SF</u> <u>0.5, centre (1,1)</u>	1

3 - (4MA0-S 2018-Paper 2FR-Q20) - TRANSFORMATION

(a)		A correct enlargement in the correct position	2	M1 Enlargement of given shape by SF 3 anywhere on grid or completely correct enlargement by SF 2 A1 Fully correct
(b)		Rotation (Centre) (0,0) 90° clockwise oe	3	B1 B1 O or origin B1 -90°, 270° If more than one transformation mentioned then no marks

4 - (4MA0-W 2018-Paper 2FR-Q12) - TRANSFORMATION

(a)(i)		5.5	1	B1
(ii)		Correct shape	1	B1
(b)		Correct reflection	2	M1 4 or 5 correct lines A1 SCB1 for correct shape and orientation in wrong position
(c)		Translation 4 to the right and 1 down	2	B2 For translation and 4 to the right and 1 down B1 for translation or 4 to the right and 1 down Accept $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$ NB: No marks for multiple transformations

