

Try these AMC 8 Algebra Questions and check your knowledge!

AMC 8,2023 Problem 1

What is the value of $(8 \times 4 + 2) - (8 + 4 \times 2)$?

- (A) 0
- (B) 6
- (C) 10
- (D) 18
- (E) 24

AMC 8,2023 Problem 3

Wind chill is a measure of how cold people feel when exposed to wind outside. A good estimate for wind chill can be found using this calculation

$(\text{wind chill}) = (\text{air temperature}) - 0.7 \times (\text{wind speed})$

where temperature is measured in degrees Fahrenheit ($^{\circ}\text{F}$)

and the wind speed is measured in miles per hour (mph). Suppose the air temperature is 36°F

and the wind speed is 18 mph. Which of the following is closest to the approximate wind chill?

- (A) 18
- (B) 23
- (C) 28
- (D) 32
- (E) 35

AMC 8,2023 Problem 5

A lake contains 250 trout, along with a variety of other fish. When a marine biologist catches and releases a sample of 180 fish from the lake, 30 are identified as trout. Assume that the ratio of trout to the total number of fish is the same in both the sample and the lake. How many fish are there in the lake?

- (A) 1250
- (B) 1500
- (C) 1750
- (D) 1800
- (E) 2000

AMC 8,2023 Problem 6

The digits 2,0,2, and 3 are placed in the expression below, one digit per box. What is the maximum possible value of the expression?

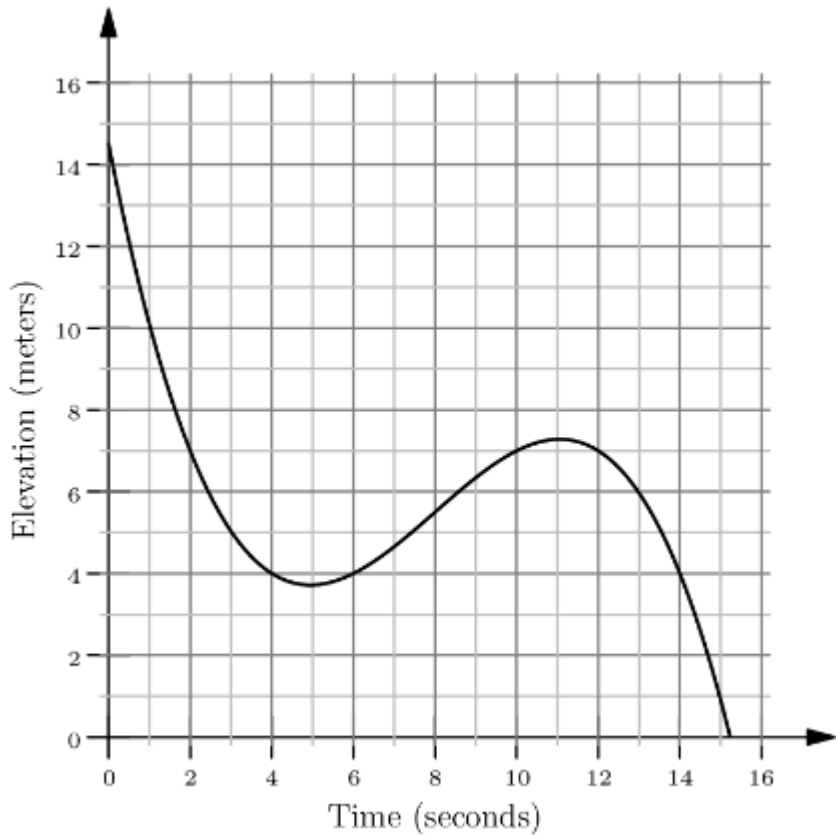
$$\boxed{}^{\boxed{}} \times \boxed{}^{\boxed{}}$$

- (A) 0
- (B) 8

- (C) 9
- (D) 16
- (E) 18

AMC 8,2023 Problem 9

Malaika is skiing on a mountain. The graph below shows her elevation, in meters, above the base of the mountain as she skis along a trail. In total, how many seconds does she spend at an elevation between 4 and 7 meters?



- (A) 6
- (B) 8
- (C) 10
- (D) 12
- (E) 14

AMC 8,2023 Problem 10

Harold made a plum pie to take on a picnic. He was able to eat only $\frac{1}{4}$ of the pie, and he left the rest for his friends. A moose came by and ate $\frac{1}{3}$ of what Harold left behind. After that, a porcupine ate $\frac{1}{3}$ of what the moose left behind. How much of the original pie still remained after the porcupine left?

- (A) $\frac{1}{12}$
- (B) $\frac{1}{6}$
- (C) $\frac{1}{4}$
- (D) $\frac{1}{3}$
- (E) $\frac{5}{12}$

AMC 8,2023 Problem 11

NASA's Perseverance Rover was launched on July 30, 2020. After traveling 292,526,838 miles, it landed on Mars in Jezero Crater about 6.5 months later. Which of the following is closest to the Rover's average interplanetary speed in miles per hour?

- (A) 6,000
- (B) 12,000
- (C) 60,000
- (D) 120,000
- (E) 600,000

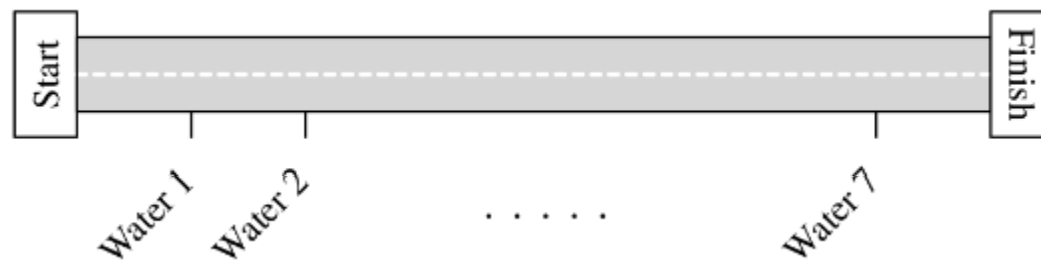
AMC 8,2023 Problem 13

Along the route of a bicycle race, 7 water stations are evenly spaced between the start and finish lines, as shown in the figure below. There are also 2 repair stations evenly spaced between the start and finish lines. The 3rd water station is located 2 miles after the 1st repair station. How long is the race in miles?





- (A) 8
- (B) 16
- (C) 24
- (D) 48
- (E) 96



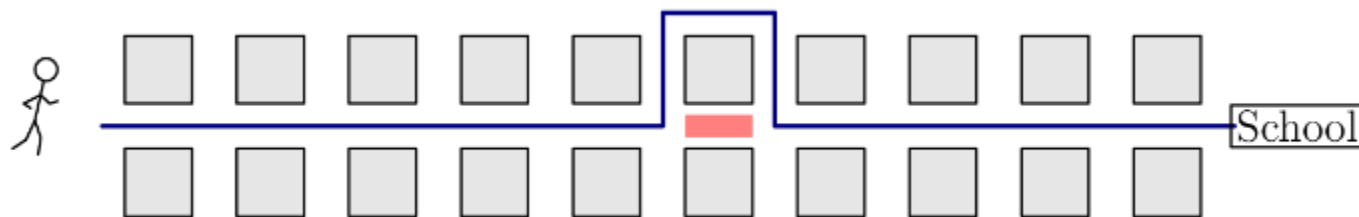
AMC 8,2023 Problem 14

Nicolas is planning to send a package to his friend Anton, who is a stamp collector. To pay for the postage, Nicolas would like to cover the package with a large number of stamps. Suppose he has a collection of 5 -cent, 10-cent, and 25 -cent stamps, with exactly 20 of each type. What is the greatest number of stamps Nicolas can use to make exactly \$7.10 in postage? (Note: The amount \$7.10 corresponds to 7 dollars and 10 cents. One dollar is worth 100 cents.)

- (A) 45
- (B) 46
- (C) 51
- (D) 54
- (E) 55

AMC 8,2023 Problem 15

Viswam walks half a mile to get to school each day. His route consists of 10 city blocks of equal length and he takes 1 minute to walk each block. Today, after walking 5 blocks, Viswam discovers he has to make a detour, walking 3 blocks of equal length instead of 1 block to reach the next corner. From the time he starts his detour, at what speed, in mph, must he walk, in order to get to school at his usual time?



- (A) 4
- (B) 4.2
- (C) 4.5
- (D) 4.8
- (E) 5

AMC 8,2023 Problem 22

In a sequence of positive integers, each term after the second is the product of the previous two terms. The sixth term is 4000

. What is the first term?

- (A) 1
- (B) 2
- (C) 4
- (D) 5
- (E) 10

AMC 8,2022 Problem 2

Consider these two operations:

$$a \diamond b = a^2 - b^2$$

$$a \star b = (a - b)^2$$

What is the value of $(5 \diamond 3) \star 6$?

- (A) -20
- (B) 4
- (C) 16
- (D) 100
- (E) 220

AMC 8,2022 Problem 5

Anna and Bella are celebrating their birthdays together. Five years ago, when Bella turned 6 years old, she received a newborn kitten as a present. Today the sum of the ages of the two children and the kitten is 30 years. How many years older than Bella is Anna?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

AMC 8,2022 Problem 6

Three positive integers are equally spaced on a number line. The middle number is 15, and the largest number is 4 times the smallest number. What is the smallest of these three numbers?

- (A) 4
- (B) 5
- (C) 6
- (D) 7
- (E) 8

AMC 8,2022 Problem 7

When the World Wide Web first became popular in the 1990 s, download speeds reached a maximum of about 56 kilobits per second. Approximately how many minutes would the download of a 4.2-megabyte song have taken at that speed? (Note that there are 8000 kilobits in a megabyte.)

- (A) 0.6
- (B) 10
- (C) 1800
- (D) 7200
- (E) 36000

AMC 8,2022 Problem 8

What is the value of

$$\frac{1}{3} \cdot \frac{2}{4} \cdot \frac{3}{5} \cdot \frac{18}{20} \cdot \frac{19}{21} \cdot \frac{20}{22}?$$

- (A) $\frac{1}{462}$
- (B) $\frac{1}{231}$
- (C) $\frac{1}{132}$
- (D) $\frac{2}{213}$
- (E) $\frac{1}{22}$

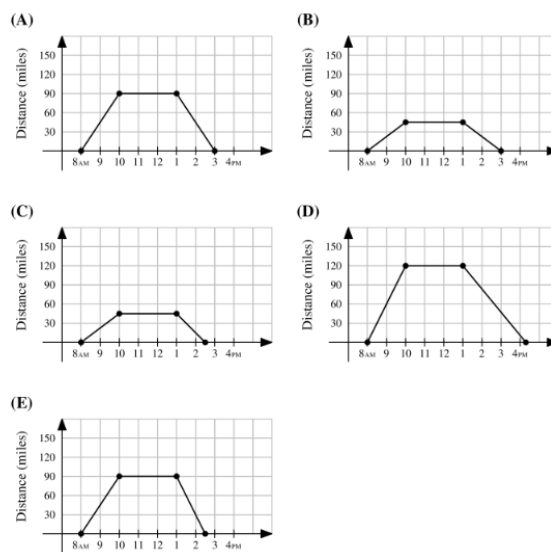
AMC 8,2022 Problem 9

A cup of boiling water (212°F) is placed to cool in a room whose temperature remains constant at 68°F . Suppose the difference between the water temperature and the room temperature is halved every 5 minutes. What is the water temperature, in degrees Fahrenheit, after 15 minutes?

- (A) 77
- (B) 86
- (C) 92
- (D) 98
- (E) 104

AMC 8,2022 Problem 10

One sunny day, Ling decided to take a hike in the mountains. She left her house at 8AM, drove at a constant speed of 45 miles per hour, and arrived at the hiking trail at 10AM. After hiking for 3 hours, Ling drove home at a constant speed of 60 miles per hour. Which of the following graphs best illustrates the distance between Ling's car and her house over the course of her trip?



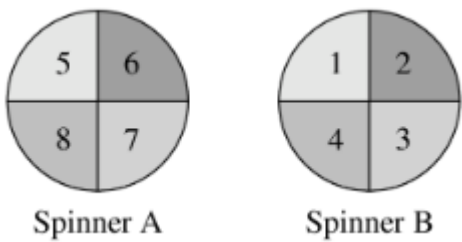
AMC 8,2022 Problem 11

Henry the donkey has a very long piece of pasta. He takes a number of bites of pasta, each time eating 3 inches of pasta from the middle of one piece. In the end, he has 10 pieces of pasta whose total length is 17 inches. How long, in inches, was the piece of pasta he started with?

- (A) 34
- (B) 38
- (C) 41
- (D) 44
- (E) 47

AMC 8,2022 Problem 12

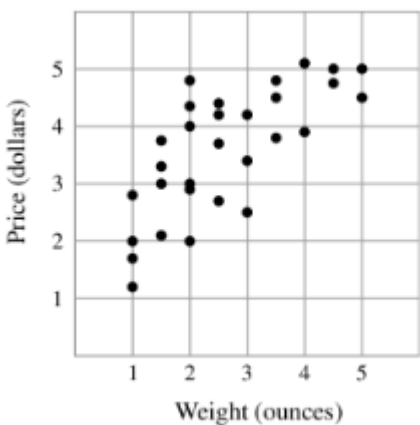
The arrows on the two spinners shown below are spun. Let the number N equal 10 times the number on Spinner A, added to the number on Spinner B. What is the probability that N is a perfect square number?



- (A) $\frac{1}{16}$
- (B) $\frac{1}{8}$
- (C) $\frac{1}{4}$
- (D) $\frac{3}{8}$
- (E) $\frac{1}{2}$

AMC 8,2022 Problem 15

Laszlo went online to shop for black pepper and found thirty different black pepper options varying in weight and price, shown in the scatter plot below. In ounces, what is the weight of the pepper that offers the lowest price per ounce?



- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

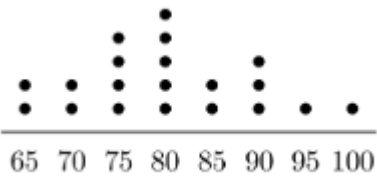
AMC 8,2022 Problem 16

Four numbers are written in a row. The average of the first two is 21 , the average of the middle two is 26 , and the average of the last two is 30 . What is the average of the first and last of the numbers?

- (A) 24
- (B) 25
- (C) 26
- (D) 27
- (E) 28

AMC 8,2022 Problem 19

Mr. Ramos gave a test to his class of 20 students. The dot plot below shows the distribution of test scores.



Later Mr. Ramos discovered that there was a scoring error on one of the questions. He regraded the tests, awarding some of the students 5 extra points, which increased the median test score to 85 . What is the minimum number of students who received extra points?
(Note that the median test score equals the average of the 2 scores in the middle if the 20 test scores are arranged in increasing order.)

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

AMC 8,2022 Problem 20

The grid below is to be filled with integers in such a way that the sum of the numbers in each row and the sum of the numbers in each column are the same. Four numbers are missing. The number x in the lower left corner is larger than the other three missing numbers. What is the smallest possible value of x ?

-2	9	5
		-1
x		8

- (A) -1
- (B) 5
- (C) 6
- (D) 8
- (E) 9

AMC 8,2022 Problem 21

Steph scored 15 baskets out of 20 attempts in the first half of a game, and 10 baskets out of 10 attempts in the second half. Candace took 12 attempts in the first half and 18 attempts in the second. In each half, Steph scored a higher percentage of baskets than Candace. Surprisingly they ended with the same overall percentage of baskets scored. How many more baskets did Candace score in the second half than in the first?

	First Half	Second Half
Steph	$\frac{15}{20}$	$\frac{10}{10}$
Candace	$\frac{\square}{12}$	$\frac{\square}{18}$

- (A) 7
- (B) 8
- (C) 9
- (D) 10
- (E) 11

AMC 8,2022 Problem 22

A bus takes 2 minutes to drive from one stop to the next, and waits 1 minute at each stop to let passengers board. Zia takes 5 minutes to walk from one bus stop to the next. As Zia reaches a bus stop, if the bus is at the previous stop or has already left the previous stop, then she will wait for the bus. Otherwise she will start walking toward the next stop. Suppose the bus and Zia start at the same time toward the library, with the bus 3 stops behind.



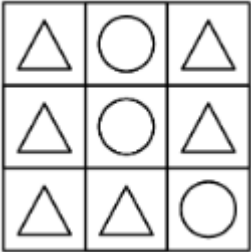
After how many minutes will Zia board the bus?



- (A) 17
- (B) 19
- (C) 20
- (D) 21
- (E) 23

AMC 8,2022 Problem 23

A Δ or $\bigcirc$ is placed in each of the nine squares in a 3 -by- 3 grid. Shown below is a sample configuration with three Δ s in a line.



How many configurations will have three Δ s in a line and three $\bigcirc$ s in a line?

- (A) 39
- (B) 42
- (C) 78
- (D) 84
- (E) 96

AMC 8,2020 Problem 1

Luka is making lemonade to sell at a school fundraiser. His recipe requires 4 times as much water as sugar and twice as much sugar as lemon juice. He uses 3 cups of lemon juice. How many cups of water does he need?

- (A) 6
- (B) 8
- (C) 12
- (D) 18
- (E) 24

AMC 8,2020 Problem 2

Four friends do yardwork for their neighbors over the weekend, earning \$15, \$20, \$25, and \$40, respectively. They decide to split their earnings equally among themselves. In total how much will the friend who earned \$40 give to the others?

- (A) \$5
- (B) \$10
- (C) \$15
- (D) \$20
- (E) \$25

AMC 8,2020 Problem 3

Carrie has a rectangular garden that measures 6 feet by 8 feet. She plants the entire garden with strawberry plants. Carrie is able to plant 4 strawberry plants per square foot, and she harvests an average of 10 strawberries per plant. How many strawberries can she expect to harvest?

- (A) 560
- (B) 960
- (C) 1120
- (D) 1920
- (E) 3840

AMC 8,2020 Problem 5

Three fourths of a pitcher is filled with pineapple juice. The pitcher is emptied by pouring an equal amount of juice into each of 5 cups. What percent of the total capacity of the pitcher did each cup receive?

- (A) 5
- (B) 10

(C) 15

(D) 20

(E) 25

AMC 8,2020 Problem 8

Ricardo has 2020 coins, some of which are pennies (1-cent coins) and the rest of which are nickels (5-cent coins). He has at least one penny and at least one nickel. What is the difference in cents between the greatest possible and least possible amounts of money that Ricardo can have?

(A) 8062

(B) 8068

(C) 8072

(D) 8076

(E) 8082

AMC 8,2020 Problem 13

Jamal has a drawer containing 6 green socks, 18 purple socks, and 12 orange socks. After adding more purple socks, Jamal noticed that there is now a 60% chance that a sock randomly selected from the drawer is purple. How many purple socks did Jamal add?

(A) 46

(B) 9

(C) 12

(D) 18

(E) 24

AMC 8,2020 Problem 15

Suppose 15% of x equals 20% of y . What percentage of x is y ?

(A) 5

(B) 35

(C) 75

(D) $133\frac{1}{3}$

(E) 300

AMC 8,2019 Problem 1

Ike and Mike go into a sandwich shop with a total of \$30.00 to spend. Sandwiches cost \$4.50 each and soft drinks cost \$1.00 each. Ike and Mike plan to buy as many sandwiches as they can, and use any remaining money to buy soft drinks. Counting both sandwiches and soft drinks, how many items will they buy?

(A) 6

(B) 7

(C) 8

(D) 9

(E) 10

AMC 8,2019 Problem 3

Which of the following is the correct order of the fractions $\frac{15}{11}$, $\frac{19}{15}$, and $\frac{17}{13}$, from least to greatest?

(A) $\frac{15}{11} < \frac{17}{13} < \frac{19}{15}$

(B) $\frac{15}{11} < \frac{19}{15} < \frac{17}{13}$

(C) $\frac{17}{13} < \frac{19}{15} < \frac{15}{11}$

(D) $\frac{19}{15} < \frac{15}{11} < \frac{17}{13}$

(E) $\frac{19}{15} < \frac{17}{13} < \frac{15}{11}$

AMC 8,2019 Problem 8

Gilda has a bag of marbles. She gives 20% of them to her friend Pedro. Then Gilda gives 10% of what is left to another friend, Ebony. Finally, Gilda gives 25% of what is now left in the bag to her brother Jimmy. What percentage of her original bag of marbles does Gilda have left for herself?

(A) 20

(B) $33\frac{1}{3}$

(C) 38

(D) 45

(E) 54



AMC 8,2019 Problem 9

Alex and Felicia each have cats as pets. Alex buys cat food in cylindrical cans that are 6 cm in diameter and 12 cm high. Felicia buys cat food in cylindrical cans that are 12 cm in diameter and 6 cm high. What is the ratio of the volume one of Alex's cans to the volume one of Felicia's cans?

- (A) 1 : 4
- (B) 1 : 2
- (C) 1 : 1
- (D) 2 : 1
- (E) 4 : 1

AMC 8,2019 Problem 11

The eighth grade class at Lincoln Middle School has 93 students. Each student takes a math class or a foreign language class or both. There are 70 eighth graders taking a math class, and there are 54 eighth graders taking a foreign language class. How many eighth graders take only a math class and not a foreign language class?

- (A) 16
- (B) 23
- (C) 31
- (D) 39
- (E) 70

AMC 8,2019 Problem 13

A palindrome is a number that has the same value when read from left to right or from right to left. (For example, 12321 is a palindrome.) Let N be the least three-digit integer which is not a palindrome but which is the sum of three distinct two-digit palindromes. What is the sum of the digits of N ?

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

AMC 8,2019 Problem 16

Qiang drives 15 miles at an average speed of 30 miles per hour. How many additional miles will he have to drive at 55 miles per hour to average 50 miles per hour for the entire trip?

- (A) 45
- (B) 62
- (C) 90
- (D) 110
- (E) 135

AMC 8,2019 Problem 17

What is the value of the product

$$\left(\frac{1 \cdot 3}{2 \cdot 2}\right) \left(\frac{2 \cdot 4}{3 \cdot 3}\right) \left(\frac{3 \cdot 5}{4 \cdot 4}\right) \cdots \left(\frac{97 \cdot 99}{98 \cdot 98}\right) \left(\frac{98 \cdot 100}{99 \cdot 99}\right)?$$

- (A) $\frac{1}{2}$
- (B) $\frac{50}{99}$
- (C) $\frac{9800}{9801}$
- (D) $\frac{100}{99}$
- (E) 50

AMC 8,2019 Problem 20

How many different real numbers x satisfy the equation

$$(x^2 - 5)^2 = 16?$$

- (A) 0
- (B) 1

- (C) 2
(D) 4
(E) 8

AMC 8,2019 Problem 23

After Euclid High School's last basketball game, it was determined that $\frac{1}{4}$ of the team's points were scored by Alexa and $\frac{2}{7}$ were scored by Chelsea. None of the other 47 team members scored more than 42 points. What was the total number of points scored by the team members?

- (A) 10
(B) 11
(C) 12
(D) 13
(E) 14

AMC 8, 2019, Problem 24

In triangle ABC , point D divides side $\overline{AC}$ so that $AD : DC = 1 : 2$. Let E be the midpoint of $\overline{BD}$ and let F be the point of intersection of line BC and line AE . Given that the area of $\triangle ABC$ is 360, what is the area of $\triangle EBF$?

AMC 8, 2018, Problem 1

An amusement park has a collection of scale models, with a ratio 1 : 20, of buildings and other sights from around the country. The height of the United States Capitol is 289 feet. What is the height in feet of its duplicate to the nearest whole number?

- (A) 14
(B) 15
(C) 16
(D) 18
(E) 20

AMC 8, 2018, Problem 2

What is the value of the product

$$\left(1 + \frac{1}{1}\right) \cdot \left(1 + \frac{1}{2}\right) \cdot \left(1 + \frac{1}{3}\right) \cdot \left(1 + \frac{1}{4}\right) \cdot \left(1 + \frac{1}{5}\right) \cdot \left(1 + \frac{1}{6}\right)$$

- (A) $\frac{7}{6}$
(B) $\frac{4}{3}$
(C) $\frac{7}{2}$
(D) 7
(E) 8

AMC 8, 2018, Problem 6

On a trip to the beach, Anh traveled 50 miles on the highway and 10 miles on a coastal access road. He drove three times as fast on the highway as on the coastal road. If Anh spent 30 minutes driving on the coastal road, how many minutes did his entire trip take?

- (A) 50
(B) 70
(C) 80
(D) 90
(E) 100

AMC 8, 2018, Problem 9

Bob is tiling the floor of his 12 foot by 16 foot living room. He plans to place one-foot by one-foot square tiles to form a border along the edges of the room and to fill in the rest of the floor with two-foot by two-foot square tiles. How many tiles will he use?

- (A) 48
(B) 87
(C) 89
(D) 96
(E) 120

AMC 8, 2018, Problem 10

The harmonic mean of a set of non-zero numbers is the reciprocal of the average of the reciprocals of the numbers. What is the harmonic mean of 1, 2, and 4?

- (A) $\frac{3}{7}$
 (B) $\frac{7}{12}$
 (C) $\frac{12}{7}$
 (D) $\frac{7}{4}$
 (E) $\frac{7}{3}$

AMC 8, 2018, Problem 12

The clock in Sri's car, which is not accurate, gains time at a constant rate. One day as he begins shopping he notes that his car clock and his watch (which is accurate) both say 12 : 00 noon. When he is done shopping, his watch says 12 : 30 and his car clock says 12 : 35. Later that day, Sri loses his watch. He looks at his car clock and it says 7 : 00. What is the actual time?

- (A) 5 : 50
 (B) 6 : 00
 (C) 6 : 30
 (D) 6 : 55
 (E) 8 : 10

AMC 8, 2018, Problem 25

How many perfect cubes lie between $2^8 + 1$ and $2^{15} + 1$, inclusive?

- (A) 4
 (B) 9
 (C) 10
 (D) 57
 (E) 58

AMC 8, 2017, Problem 1

Which of the following values is largest?

- (A) $2 + 0 + 1 + 7$
 (B) $2 \times 0 + 1 + 7$
 (C) $2 + 0 \times 1 + 7$
 (D) $2 + 0 + 1 \times 7$
 (E) $2 \times 0 \times 1 \times 7$

AMC 8, 2017, Problem 3

What is the value of the expression $\sqrt{16\sqrt{8\sqrt{4}}}$?

- (A) 4
 (B) $4\sqrt{2}$
 (C) 8
 (D) $8\sqrt{2}$
 (E) 16

AMC 8, 2017, Problem 4

When 0.000315 is multiplied by 7,928,564 the product is closest to which of the following?

- (A) 210
 (B) 240
 (C) 2100
 (D) 2400
 (E) 24000

AMC 8, 2017, Problem 5

What is the value of the expression $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8}{1 + 2 + 3 + 4 + 5 + 6 + 7 + 8}$?

- (A) 1020
 (B) 1120
 (C) 1220
 (D) 2240
 (E) 3360

AMC 8, 2017, Problem 6

If the degree measures of the angles of a triangle are in the ratio 3 : 3 : 4, what is the degree measure of the largest angle?

- (A) 18
- (B) 36
- (C) 60
- (D) 72
- (E) 90

AMC 8, 2017, Problem 9

All of Marcy's marbles are blue, red, green, or yellow. One third of her marbles are blue, one fourth of them are red, and six of them are green. What is the smallest number of yellow marbles that Macy could have?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

AMC 8, 2017, Problem 11

A square-shaped floor is covered with congruent square tiles. If the total number of tiles that lie on the two diagonals is 37, how many tiles cover the floor?

- (A) 148
- (B) 3244
- (C) 361
- (D) 1296
- (E) 1369

AMC 8, 2017, Problem 14

Chloe and Zoe are both students in Ms. Demeanor's math class. Last night they each solved half of the problems in their homework assignment alone and then solved the other half together. Chloe had correct answers to only 80% of the problems she solved alone, but overall 88% of her answers were correct. Zoe had correct answers to 90% of the problems she solved alone. What was Zoe's overall percentage of correct answers?

- (A) 89
- (B) 92
- (C) 93
- (D) 96
- (E) 98

AMC 8, 2017, Problem 17

Starting with some gold coins and some empty treasure chests, I tried to put 9 gold coins in each treasure chest, but that left 2 treasure chests empty. So instead I put 6 gold coins in each treasure chest, but then I had 3 gold coins left over. How many gold coins did I have?

- (A) 9
- (B) 27
- (C) 45
- (D) 63
- (E) 81

AMC 8, 2017, Problem 23

Each day for four days, Linda traveled for one hour at a speed that resulted in her traveling one mile in an integer number of minutes. Each day after the first, her speed decreased so that the number of minutes to travel one mile increased by 5 minutes over the preceding day. Each of the four days, her distance traveled was also an integer number of miles. What was the total number of miles for the four trips?

- (A) 10
- (B) 15
- (C) 25
- (D) 50
- (E) 82

AMC 8, 2016, Problem 1

The longest professional tennis match ever played lasted a total of 11 hours and 5 minutes. How many minutes was this?

- (A) 605



- (B) 655
- (C) 665
- (D) 1005
- (E) 1105

AMC 8, 2016, Problem 3

Four students take an exam. Three of their scores are 70, 80 , and 90. If the average of their four scores is 70 , then what is the remaining score?

- (A) 40
- (B) 50
- (C) 55
- (D) 60
- (E) 70

AMC 8, 2016, Problem 4

When Cheenu was a boy he could run 15 miles in 3 hours and 30 minutes. As an old man he can now walk 10 miles in 4 hours. How many minutes longer does it take for him to walk a mile now compared to when he was a boy?

- (A) 6
- (B) 10
- (C) 15
- (D) 18
- (E) 30

AMC 8, 2016, Problem 7

Which of the following numbers is not a perfect square?

- (A) 1^{2016}
- (B) 2^{2017}
- (C) 3^{2018}
- (D) 4^{2019}
- (E) 5^{2020}

AMC 8, 2016, Problem 10

Suppose that $a * b$ means $3a - b$. What is the value of x if

$$2 * (5 * x) = 1$$

- (A) $\frac{1}{10}$
- (B) 2
- (C) $\frac{10}{3}$
- (D) 10
- (E) 14

AMC 8, 2016, Problem 11

Determine how many two-digit numbers satisfy the following property: when the number is added to the number obtained by reversing its digits, the sum is 132 .

- (A) 5
- (B) 7
- (C) 9
- (D) 11
- (E) 12

AMC 8, 2016, Problem 12

Jefferson Middle School has the same number of boys and girls. $\frac{3}{4}$ of the girls and $\frac{2}{3}$ of the boys went on a field trip. What fraction of the students on the field trip were girls?

- (A) $\frac{1}{2}$
- (B) $\frac{9}{17}$
- (C) $\frac{7}{13}$
- (D) $\frac{2}{3}$
- (E) $\frac{14}{15}$

AMC 8, 2016, Problem 14

Karl's car uses a gallon of gas every 35 miles, and his gas tank holds 14 gallons when it is full. One day, Karl started with a full tank, drove 100 miles, bought 8 gallons of gas, and continued driving to his destination. When he arrived, his gas tank was half full. How many miles did he drive that day?

- (A) 525
- (B) 560
- (C) 595
- (D) 665
- (E) 735

AMC 8, 2016, Problem 16

Annie and Bonnie are running laps around a 400-meter oval track. They started together, but Annie has pulled ahead, because she runs 25% faster than Bonnie. How many laps will Annie have run when she first passes Bonnie?

- (A) $1\frac{1}{4}$
- (B) $3\frac{1}{3}$
- (C) 4
- (D) 5
- (E) 25

AMC 8, 2015, Problem 3

Jack and Jill are going swimming at a pool that is one mile from their house. They leave home simultaneously. Jill rides her bicycle to the pool at a constant speed of 10 miles per hour. Jack walks to the pool at a constant speed of 4 miles per hour. How many minutes before Jack does Jill arrive?

- (A) 5
- (B) 6
- (C) 8
- (D) 9
- (E) 10

AMC 8, 2015, Problem 9

On her first day of work, Janabel sold one widget. On day two, she sold three widgets. On day three, she sold five widgets, and on each succeeding day, she sold two more widgets than she had sold on the previous day. How many widgets in total had Janabel sold after working 20 days?

- (A) 39
- (B) 40
- (C) 210
- (D) 400
- (E) 401

AMC 8, 2015, Problem 16

In a middle-school mentoring program, a number of the sixth graders are paired with a ninth-grade student as a buddy. No ninth grader is assigned more than one sixth-grade buddy. If $\frac{1}{3}$ of all the ninth graders are paired with $\frac{2}{5}$ of all the sixth graders, what fraction of the total number of sixth and ninth graders have a buddy?

- (A) $\frac{2}{15}$
- (B) $\frac{4}{11}$
- (C) $\frac{11}{30}$
- (D) $\frac{3}{8}$
- (E) $\frac{11}{15}$

AMC 8, 2015, Problem 17

Jeremy's father drives him to school in rush hour traffic in 20 minutes. One day there is no traffic, so his father can drive him 18 miles per hour faster and gets him to school in 12 minutes. How far in miles is it to school?

- (A) 44
- (B) 6
- (C) 8
- (D) 9
- (E) 12

AMC 8, 2015, Problem 20

Ralph went to the store and bought 12 pairs of socks for a total of \$24. Some of the socks he bought cost \$1 a pair, some cost \$2 a pair, and some of the socks he bought cost \$4 a pair. If he bought at least one pair of each type, how many pairs of \$1 socks did he buy?

- (A) 4
- (B) 5
- (C) 6
- (D) 7
- (E) 8

AMC 8, 2014, Problem 1

Harry and Terry are each told to calculate $8 - (2 + 5)$. Harry gets the correct answer. Terry ignores the parentheses and calculates $8 - 2 + 5$. If Harry's answer is H and Terry's answer is T , what is $H - T$?

- (A) -10
- (B) -6
- (C) 0
- (D) 6
- (E) 10

AMC 8, 2014, Problem 2

Paul owes Paula 35 cents and has a pocket full of 5-cent coins, 10-cent coins, and 25-cent coins that he can use to pay her. What is the difference between the largest and the smallest number of coins he can use to pay her?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

AMC 8, 2014, Problem 3

Isabella had a week to read a book for a school assignment. She read an average of 36 pages per day for the first three days and an average of 44 pages per day for the next three days. She then finished the book by reading 10 pages on the last day. How many pages were in the book?

- (A) 240
- (B) 250
- (C) 260
- (D) 270
- (E) 280

AMC 8, 2014, Problem 4

The sum of two prime numbers is 85. What is the product of these two prime numbers?

- (A) 85
- (B) 91
- (C) 115
- (D) 133
- (E) 166

AMC 8, 2015, Problem 5

Margie's car can go 32 miles on a gallon of gas, and gas currently costs \$4 per gallon. How many miles can Margie drive on \$20 worth of gas?

- (A) 64
- (B) 128
- (C) 160
- (D) 320
- (E) 640

AMC 8, 2015, Problem 6

Six rectangles each with a common base width of 2 have lengths of 1, 4, 9, 16, 25, and 36. What is the sum of the areas of the six rectangles?

- (A) 91
- (B) 93
- (C) 162
- (D) 182
- (E) 202



AMC 8, 2015, Problem 7

There are four more girls than boys in Ms. Raub's class of 28 students. What is the ratio of number of girls to the number of boys .

- (A) 3 : 4
- (B) 4 : 3
- (C) 3 : 2
- (D) 7 : 4
- (E) 2 : 1

AMC 8, 2015, Problem 10

The first AMC 8 was given in 1985 and it has been given annually since that time. Samantha turned 12 years old the year that she took the seventh AMC 8 . In what year was Samantha born?

- (A) 1979
- (B) 1980
- (C) 1981
- (D) 1982
- (E) 1983

AMC 8, 2014, Problem 17

George walks 1 mile to school. He leaves home at the same time each day, walks at a steady speed of 3 miles per hour, and arrives just as school begins.

Today he was distracted by the pleasant weather and walked the first $\frac{1}{2}$ mile at a speed of only 2 miles per hour. At how many miles per hour must George run the last $\frac{1}{2}$ mile in order to arrive just as school begins today?

- (A) 4
- (B) 6
- (C) 8
- (D) 10
- (E) 12

AMC 8, 2014, Problem 19

A cube with 3 -inch edges is to be constructed from 27 smaller cubes with 1 -inch edges. Twenty-one of the cubes are colored red and 6 are colored white. If the 3 -inch cube is constructed to have the smallest possible white surface area showing, what fraction of the surface area is white?

- (A) $\frac{5}{54}$
- (B) $\frac{1}{9}$
- (C) $\frac{5}{27}$
- (D) $\frac{2}{9}$
- (E) $\frac{1}{3}$

AMC 8, 2014, Problem 24

One day the Beverage Barn sold 252 cans of soda to 100 customers, and every customer bought at least one can of soda. What is the maximum possible median number of cans of soda bought per customer on that day?

- (A) 2.5
- (B) 3.0
- (C) 3.5
- (D) 4.0
- (E) 4.5

AMC 8, 2013, Problem 1

Danica wants to arrange her model cars in rows with exactly 6 cars in each row. She now has 23 model cars. What is the smallest number of additional cars she must buy in order to be able to arrange all her cars this way?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

AMC 8, 2013, Problem 2

A sign at the fish market says, "50% off, today only: half-pound packages for just \$3 per package." What is the regular price for a full pound of fish, in



dollars?

- (A) 6
- (B) 9
- (C) 10
- (D) 12
- (E) 15

AMC 8, 2013, Problem 4

Eight friends ate at a restaurant and agreed to share the bill equally. Because Judi forgot her money, each of her seven friends paid an extra \$2.50 to cover her portion of the total bill. What was the total bill?

- (A) \$120
- (B) \$128
- (C) \$140
- (D) \$144
- (E) \$160

AMC 8, 2013, Problem 7

Trey and his mom stopped at a railroad crossing to let a train pass. As the train began to pass, Trey counted 6 cars in the first 10 seconds. It took the train 2 minutes and 45 seconds to clear the crossing at a constant speed. Which of the following was the most likely number of cars in the train?

- (A) 60
- (B) 80
- (C) 100
- (D) 120
- (E) 140

AMC 8, 2013, Problem 10

What is the ratio of the least common multiple of 180 and 594 to the greatest common factor of 180 and 594 ?

- (A) 110
- (B) 165
- (C) 330
- (D) 625
- (E) 660

AMC 8, 2013, Problem 11

Ted's grandfather used his treadmill on 3 days this week. He went 2 miles each day. On Monday he jogged at a speed of 5 miles per hour. He walked at the rate of 3 miles per hour on Wednesday and at 4 miles per hour on Friday. If Grandfather had always walked at 4 miles per hour, he would have spent less time on the treadmill. How many minutes less?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

AMC 8, 2013, Problem 12

At the 2013 Winnebago County Fair a vendor is offering a "fair special" on sandals. If you buy one pair of sandals at the regular price of \$50, you get a second pair at a 40% discount, and a third pair at half the regular price. Javier took advantage of the "fair special" to buy three pairs of sandals. What percentage of the \$150 regular price did he save?

- (A) 25
- (B) 30
- (C) 33
- (D) 40
- (E) 45

AMC 8, 2013, Problem 13

When Clara totaled her scores, she inadvertently reversed the units digit and the tens digit of one score. By which of the following might her incorrect sum have differed from the correct one?

- (A) 45
- (B) 46



(B) 46

(C) 47

(D) 48

(E) 49

AMC 8, 2013, Problem 14

If $3^p + 3^4 = 90$, $2^r + 44 = 76$, and $5^3 + 6^s = 1421$, what is the product of p , r , and s ?

(A) 27

(B) 40

(C) 50

(D) 70

(E) 90

AMC 8, 2013, Problem 16

A number of students from Fibonacci Middle School are taking part in a community service project. The ratio of 8th -graders to 6th -graders is 5 : 3, and the the ratio of 8th -graders to 7th -graders is 8 : 5. What is the smallest number of students that could be participating in the project?

(A) 16

(B) 40

(C) 55

(D) 79

(E) 89

AMC 8, 2012, Problem 1

Rachelle uses 3 pounds of meat to make 8 hamburgers for her family. How many pounds of meat does she need to make 24 hamburgers for a neighbourhood picnic?

(A) 6

(B) $6\frac{2}{3}$

(C) $7\frac{1}{2}$

(D) 8

(E) 9

AMC 8, 2012, Problem 2

In the country of East Westmore, statisticians estimate there is a baby born every 8 hours and a death every day. To the nearest hundred, how many people are added to the population of East Westmore each year?

(A) 600

(B) 700

(C) 800

(D) 900

(E) 1000

AMC 8, 2012, Problem 3

On February 13 The Oshkosh Northwestern listed the length of daylight as 10 hours and 24 minutes, the sunrise was 6 : 57AM, and the sunset as 8 : 15PM. The length of daylight and sunrise were correct, but the sunset was wrong. When did the sun really set?

(A) 5 : 10PM

(B) 5 : 21PM

(C) 5 : 41PM

(D) 5 : 57PM

(E) 6 : 03PM

AMC 8, 2012, Problem 4

Peter's family ordered a 12-slice pizza for dinner. Peter ate one slice and shared another slice equally with his brother Paul. What fraction of the pizza did Peter eat?

(A) $\frac{1}{24}$

(B) $\frac{1}{12}$

(C) $\frac{1}{8}$

(D) $\frac{1}{6}$

(E) $\frac{1}{4}$



AMC 8, 2012, Problem 8

A shop advertises everything is "half price in today's sale." In addition, a coupon gives a 20% discount on sale prices. Using the coupon, the price represents what percentage off the original price?

- (A) 10
- (B) 33
- (C) 40
- (D) 60
- (E) 70

AMC 8, 2012, Problem 9

The Fort Worth Zoo has a number of two-legged birds and a number of four-legged mammals. On one visit to the zoo, Margie counted 200 heads and 522 legs. How many of the animals that Margie counted were two-legged birds?

- (A) 61
- (B) 122
- (C) 139
- (D) 150
- (E) 161

AMC 8, 2012, Problem 13

Jamar bought some pencils costing more than a penny each at the school bookstore and paid \$1.43. Sharona bought some of the same pencils and paid \$1.87. How many more pencils did Sharona buy than Jamar?

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

AMC 8, 2012, Problem 20

What is the correct ordering of the three numbers $\frac{5}{19}$, $\frac{7}{21}$, and $\frac{9}{23}$, in increasing order?

- (A) $\frac{9}{23} < \frac{7}{21} < \frac{5}{19}$
- (B) $\frac{5}{19} < \frac{7}{21} < \frac{9}{23}$
- (C) $\frac{9}{23} < \frac{5}{19} < \frac{7}{21}$
- (D) $\frac{5}{19} < \frac{9}{23} < \frac{7}{21}$
- (E) $\frac{7}{21} < \frac{5}{19} < \frac{9}{23}$

AMC 8, 2011, Problem 1

Margie bought 3 apples at a cost of 50 cents per apple. She paid with a 5-dollar bill. How much change did Margie receive?

- (A) \$1.50
- (B) \$2.00
- (C) \$2.50
- (D) \$3.00
- (E) \$3.50

AMC 8, 2011, Problem 6

In a town of 351 adults, every adult owns a car, motorcycle, or both. If 331 adults own cars and 45 adults own motorcycles, how many of the car owners do not own a motorcycle?

- (A) 20
- (B) 25
- (C) 45
- (D) 306
- (E) 351

AMC 8, 2011, Problem 10

The taxi fare in Gotham City is \$2.40 for the first $\frac{1}{2}$ mile and additional mileage charged at the rate \$0.20 for each additional 0.1 mile. You plan to give the driver a \$2 tip. How many miles can you ride for \$10?

- (A) 3.0
- (B) 3 25

- (C) 3.3
- (D) 3.5
- (E) 3.75

AMC 8, 2011, Problem 14

There are 270 students at Colfax Middle School, where the ratio of boys to girls is 5 : 4. There are 180 students at Winthrop Middle School, where the ratio of boys to girls is 4 : 5. The two schools hold a dance and all students from both schools attend. What fraction of the students at the dance are girls?

- (A) $\frac{7}{18}$
- (B) $\frac{7}{15}$
- (C) $\frac{22}{45}$
- (D) $\frac{1}{2}$
- (E) $\frac{23}{45}$

AMC 8, 2011, Problem 17

Let w , x , y , and z be whole numbers. If $2^w \cdot 3^x \cdot 5^y \cdot 7^z = 588$, then what does $2w + 3x + 5y + 7z$ equal?

- (A) 21
- (B) 25
- (C) 27
- (D) 35
- (E) 56

AMC 8, 2010, Problem 1

At Euclid Middle School the mathematics teachers are Mrs. Germain, Mr. Newton, and Mrs. Young. There are 11 students in Mrs. Germain's class, 8 students in Mr. Newton's class, and 9 students in Mrs. Young's class taking the AMC 8 this year. How many mathematics students at Euclid Middle School are taking the contest?

- (A) 26
- (B) 27
- (C) 28
- (D) 29
- (E) 30

AMC 8, 2010, Problem 5

Alice needs to replace a light bulb located 10 centimeters below the ceiling in her kitchen. The ceiling is 2.4 meters above the floor. Alice is 1.5 meters tall and can reach 46 centimeters above the top of her head. Standing on a stool, she can just reach the light bulb. What is the height of the stool, in centimeters?

- (A) 32
- (B) 34
- (C) 36
- (D) 38
- (E) 40

AMC 8, 2010, Problem 7

Using only pennies, nickels, dimes, and quarters, what is the smallest number of coins Freddie would need so he could pay any amount of money less than a dollar?

- (A) 6
- (B) 10
- (C) 15
- (D) 25
- (E) 99

AMC 8, 2010, Problem 8

As Emily is riding her bicycle on a long straight road, she spots Emerson skating in the same direction $1\frac{1}{2}$ mile in front of her. After she passes him, she can see him in her rear mirror until he is $1\frac{1}{2}$ mile behind her. Emily rides at a constant rate of 12 miles per hour, and Emerson skates at a constant rate of 8 miles per hour. For how many minutes can Emily see Emerson?

- (A) 6
- (B) 8
- (C) 12

- (D) 15
- (E) 16

AMC 8, 2010, Problem 9

Ryan got 80% of the problems correct on a 25-problem test, 90% on a 40-problem test, and 70% on a 10-problem test. What percent of the problems did Ryan answer correctly?

- (A) 64
- (B) 75
- (C) 80
- (D) 84
- (E) 86

AMC 8, 2010, Problem 10

Six pepperoni circles will exactly fit across the diameter of a 12 -inch pizza when placed. If a total of 24 circles of pepperoni are placed on this pizza without overlap, what fraction of the pizza is covered by pepperoni?

- (A) $\frac{1}{2}$
- (B) $\frac{2}{3}$
- (C) $\frac{3}{4}$
- (D) $\frac{5}{6}$
- (E) $\frac{7}{8}$

AMC 8, 2010, Problem 11

The top of one tree is 16 feet higher than the top of another tree. The heights of the two trees are in the ratio 3 : 4. In feet, how tall is the taller tree?

- (A) 48
- (B) 64
- (C) 80
- (D) 96
- (E) 112

AMC 8, 2010, Problem 12

Of the 500 balls in a large bag, 80% are red and the rest are blue. How many of the red balls must be removed so that 75% of the remaining balls are red?

- (A) 25
- (B) 50
- (C) 75
- (D) 100
- (E) 150

AMC 8, 2010, Problem 13

The lengths of the sides of a triangle in inches are three consecutive integers. The length of the shortest side is 30% of the perimeter. What is the length of the longest side?

- (A) 7
- (B) 8
- (C) 9
- (D) 10
- (E) 11

AMC 8, 2010, Problem 15

A jar contains 5 different colors of gumdrops. 30% are blue, 20% are brown, 15% are red, 10% are yellow, and other 30 gumdrops are green. half of the blue gumdrops are replaced with brown gumdrops, how many gumdrops will be brown?

- (A) 35
- (B) 36
- (C) 42
- (D) 48
- (E) 64

AMC 8, 2010, Problem 16

A square and a circle have the same area. What is the ratio of the side length of the square to the radius of the circle?



- (A) $\frac{\sqrt{\pi}}{2}$
 (B) $\sqrt{\pi}$
 (C) π
 (D) 2π
 (E) π^2

AMC 8, 2010, Problem 24

What is the correct ordering of the three numbers, 10^8 , 5^{12} , and 2^{24} ?

- (A) $2^{24} < 10^8 < 5^{12}$
 (B) $2^{24} < 5^{12} < 10^8$
 (C) $5^{12} < 2^{24} < 10^8$
 (D) $10^8 < 5^{12} < 2^{24}$
 (E) $10^8 < 2^{24} < 5^{12}$

AMC 8, 2009, Problem 1

Bridget bought a bag of apples at the grocery store. She gave half of the apples to Ann. Then she gave Cassie 3 apples, keeping 4 apples for herself. How many apples did Bridget buy?

- (A) 3
 (B) 4
 (C) 7
 (D) 11
 (E) 14

AMC 8, 2009, Problem 2

On average, for every 4 sports cars sold at the local dealership, 7 sedans are sold. The dealership predicts that it will sell 28 sports cars next month. How many sedans does it expect to sell?

- (A) 7
 (B) 32
 (C) 35
 (D) 49
 (E) 112

AMC 8, 2009, Problem 6

Steve's empty swimming pool will hold 24,000 gallons of water when full. It will be filled by 4 hoses, each of which supplies 2.5 gallons of water per minute. How many hours will it take to fill Steve's pool?

- (A) 40
 (B) 42
 (C) 44
 (D) 46
 (E) 48

AMC 8, 2009, Problem 7

If $\frac{3}{5} = \frac{M}{45} = \frac{60}{N}$, what is $M + N$?

- (A) 27 (B) 29 (C) 45 (D) 105 (E) 127

AMC 8, 2009, Problem 11

The Amaco Middle School bookstore sells pencils costing a whole number of cents. Some seventh graders each bought a pencil, paying a total of 1.43 dollars. Some of the 30 sixth graders each bought a pencil, and they paid a total of 1.95 dollars. How many more sixth graders than seventh graders bought a pencil?

- (A) 1
 (B) 2
 (C) 3
 (D) 4
 (E) 5

AMC 8, 2009, Problem 14

Austin and Temple are 50 miles apart along Interstate 35 . Bonnie drove from Austin to her daughter's house in Temple, averaging 60 miles per hour. Leaving the car with her daughter, Bonnie rode a bus back to Austin along the same route and averaged 40 miles per hour on the return trip. What was

the average speed for the round trip, in miles per hour?

- (A) 46
- (B) 48
- (C) 50
- (D) 52
- (E) 54

AMC 8, 2009, Problem 15

A recipe that makes 5 servings of hot chocolate requires 2 squares of chocolate, $\frac{1}{4}$ cup sugar, 1 cup water and 4 cups milk. Jordan has 5 squares of chocolate, 2 cups of sugar, lots of water, and 7 cups of milk. If he maintains the same ratio of ingredients, what is the greatest number of servings of hot chocolate he can make?

- (A) $5\frac{1}{8}$
- (B) $6\frac{1}{4}$
- (C) $7\frac{1}{2}$
- (D) $8\frac{3}{4}$
- (E) $9\frac{7}{8}$

AMC 8, 2009, Problem 21

Andy and Bethany have a rectangular array of numbers greater than zero with 40 rows and 75 columns. Andy adds the numbers in each row. The average of his 40 sums is A . Bethany adds the numbers in each column. The average of her 75 sums is B . Using only the answer choices given, What is the value of $\frac{A}{B}$?

- (A) $\frac{64}{225}$
- (B) $\frac{8}{15}$
- (C) 1
- (D) $\frac{15}{8}$
- (E) $\frac{225}{64}$

AMC 8, 2009, Problem 23

On the last day of school, Mrs. Awesome gave jelly beans to her class. She gave each boy as many jelly beans as there were boys in the class. She gave each girl as many jelly beans as there were girls in the class. She brought 400 jelly beans, and when she finished, she had six jelly beans left. There were two more boys than girls in her class. How many students were in her class?

- (A) 26
- (B) 28
- (C) 30
- (D) 32
- (E) 34

AMC 8, 2007, Problem 18

The product of the two 99 -digit numbers $303, 030, 303, \dots, 030, 303$ and $505, 050, 505, \dots, 050, 505$ has thousands digit A and units digit B . What is the sum of A and B ?

- (A) 3
- (B) 5
- (C) 6
- (D) 8
- (E) 10

AMC 8, 2007, Problem 19

Pick two consecutive positive integers whose sum is less than 100. Square both of those integers and then find the difference of the squares. Which of the following could be the difference?

- (A) 2
- (B) 64
- (C) 79
- (D) 96
- (E) 131

AMC 8, 2004, Problem 9

The average of the five numbers in a list is 54 . The average of the first two numbers is 48. What is the average of the last three numbers?

- (A) 55

- (B) 56
(C) 57
(D) 58
(E) 59

AMC 8, 2004, Problem 10

Handy Aaron helped a neighbor $1\frac{1}{4}$ hours on Monday, 50 minutes on Tuesday, from 8 : 20 to 10 : 45 on Wednesday morning, and a half-hour on .
He is paid \$3 per hour. How much did he earn for the week?

- (A) \$8
(B) \$9
(C) \$10
(D) \$12
(E) \$15

AMC 8, 2004, Problem 11

The numbers $-2, 4, 6, 9$ and 12 are rearranged according to these rules:

The largest isn't first, but it is in one of the first three places. The smallest isn't last, but it is in one of the last three places. The median isn't first or last.
What is the average of the first and last numbers?

- (A) 3.5
(B) 5
(C) 6.5
(D) 7.5
(E) 8

AMC 8, 2004, Problem 12

Niki usually leaves her cell phone on. If her cell phone is on but she is not actually using it, the battery will last for 24 hours. If she is using it constantly, the battery will last for only 3 hours. Since the last recharge, her phone has been on 9 hours, and during that time she has used it for 60 minutes. If she doesn't talk anymore but leaves the phone on, how many more hours will the battery last?

- (A) 7
(B) 8
(C) 11
(D) 14
(E) 15

AMC 8, 2001, Problem 12

If $a \otimes b = \frac{a+b}{a-b}$, then $(6 \otimes 4) \otimes 3 =$

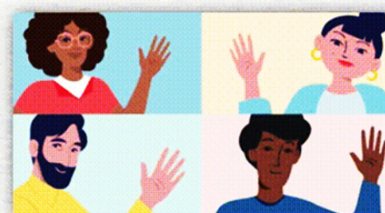
- (A) 4
(B) 13
(C) 15
(D) 30
(E) 72



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Soluciones

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	A	A	E	B	E	C	B	B	C	D	D	B	C	B	A	B	D	D	E	B	B	D	D	B	E	C
2	B	A	B	E	D	A	C	D	C	D	C	C	D	E	C	A	D	A	C	B	C	C	E	A	D	D
3	D	C	E	B	A	E	E	D	B	C	E	A	B	B	D	D	E	C	D	A	D	A	C	A	C	C
4	C	C	C	E	E	E	E	E	E	B	C	B	E	E	A	E	E	B	C	B	C	B	D	C	B	C
5	C	D	A	B	D	B	B	E	C	B	C	A	A	B	D	C	C	C	B	D	B	D	B	E	D	B
6	D	E	B	B	C	D	C	D	B	A	C	C	C	B	E	A	B	A	B	C	C	C	E	D	A	E
7	C	B	C	D	D	C	D	A	A	B	B	B	D	D	E	B	A	E	A	B	B	B	D	E	C	B
8	A	E	B	C	E	D	D	C	D	C	D	B	B	C	A	D	E	D	A	B	E	E	B	D	B	D
9	A	E	C	C	C	D	B	B	D	A	C	D	C	C	C	D	D	B	C	D	D	C	B	D	B	D
10	C	B	B	E	D	A	B	B	B	A	A	D	C	E	E	E	A	E	E	E	D	A	D	D	D	B
11	E	A	B	C	B	E	B	B	C	B	D	D	A	C	D	C	C	C	B	C	C	C	D	A	D	B
12	B	D	C	A	E	B	D	C	E	A	E	B	D	A	B	D	A	B	E	B	D	D	A	C	D	D
13	B	C	E	C	A	C	C	B	D	C	E	E	A	C	C	C	D	E	B	E	C	D	C	C	B	E
14	B	C	B	E	C	B	D	D	C	E	B	B	D	E	D	D	C	B	D	C	B	B	C	C	B	C
15	C	B	D	D	D	E	C	C	A	A	B	E	B	D	D	C	A	E	B	C	C	C	A	B	D	C
16	D	A	E	B	A	D	B	B	C	E	C	C	E	B	B	C	E	E	D	C	D	E	A	D	D	B
17	D	E	D	C	B	A	C	B	B	D	D	C	E	C	C	A	B	C	E	D	E	B	C	D	B	D
18	E	B	C	B	B	C	C	A	A	B	C	A	B	B	E	E	D	E	D	A	C	D	D	E	C	C
19	B	D	A	A	B	B	C	C	A	E	D	C	D	A	B	C	D	D	C	B	A	D	C	B	D	C
20	C	D	A	D	D	A	A	D	D	D	B	A	A	D	B	A	A	D	D	D	A	C	A	B	D	A
21	E	E	C	B	D	B	A	B	D	C	B	D	D	B	B	B	D	E	B	D	C	A	D	C	D	C
22	B	C	D	D	C	B	D	C	D	D	A	B	E	D	D	C	E	C	C	B	E	D	C	A	D	E
23	E	B	D	C	C	B	A	B	C	D	B	E	C	C	C	B	D	B	A	D	B	A	B	C	B	B
24	D	B	D	E	E	C	E	A	C	B	C	C	C	E	B	D	B	B	B	C	B	A	C	C	E	A
25	A	D	A	D	C	C	C	D	E	A	D	A	D	D	A	B	D	B	C	D	A	B	B	A	E	E

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2022	2023	2024	
1	E	E	A	A	A	C	A	A	D	E	A	D	B	
2	E	B	D	E	D	A	E	D	E	C	D	E	C	
3	D	B	E	B	D	A	C	D	E	D	E	B	E	
4	C	C	C	E	E	B	D	C	D	B	E	D	E	
5	D	E	E	C	A	E	B	E	B	C	C	B	B	
6	D	E	C	D	B	B	D	C	C	A	C	C	D	
7	C	B	C	B	E	B	A	B	A	C	B	B	E	
8	B	D	C	D	D	C	D	C	E	C	B	A	D	
9	E	C	C	D	D	B	D	B	B	D	B	B	E	
10	C	D	C	A	B	D	C	C	B	C	E	D	B	
11	A	D	D	A	B	B	C	C	D	E	D	C	D	
12	B	A	B	B	C	B	D	B	A	A	B	B	E	
13	C	C	A	D	D	D	B	A	A	B	D	D	B	
14	C	B	C	B	D	A	C	D	C	D	D	E	A	
15	D	D	B	C	D	C	D	D	B	C	C	B	C	
16	C	C	E	B	B	D	D	C	D	E	B	C	D	
17	A	B	B	B	D	D	C	A	B	B	B	A	E	
18	D	A	B	D	B	C	B	E	C	A	C	D	A	
19	D	C	D	A	A	E	D	C	C	B	C	C	C	
20	D	B	C	B	D	A	B	A	D	B	D	D	D	
21	C	D	E	A	C	B	A	E	E	A	C	C	E	
22	D	D	E	E	C	C	D	B	E	E	A	D	B	
23	D	C	B	A	D	C	C	D	B	B	D	C	C	
24	A	A	C	C	B	A	D	C	B	A	C	A	B	
25	A	C	A	B	C	B	B	E	C	A	E	A	C	