

AMC 10 Algebra Previous Year Questions - Year wise

Get rolling on your preparation for AMC 10. This has all the AMC 10 Algebra previous year Questions, year-wise. Try out these problems:

AMC 10A, 2021, Problem 1

What is the value of

$$(2^2 - 2) - (3^2 - 3) + (4^2 - 4)$$

- (A) 1
- (B) 2
- (C) 5
- (D) 8
- (E) 12

AMC 10A, 2021, Problem 2

Portia's high school has 3 times as many students as Lara's high school. The two high schools have a total of 2600 students. How many students does Portia's high school have?

- (A) 600
- (B) 650
- (C) 1950
- (D) 2000
- (E) 2050

AMC 10A, 2021, Problem 3

The sum of two natural numbers is 17,402 . One of the two numbers is divisible by 10 . If the units digit is erased, the other number is obtained. What is the difference of these two numbers?

- (A) 10,272
- (B) 11,700
- (C) 13,362
- (D) 14,238
- (E) 15,426

AMC 10A, 2021, Problem 4

A cart rolls down a hill, travelling 5 inches the first second and accelerating so that during each successive 1 -second time interval, it travels inches more than during the previous 1 -second interval.

The cart takes 30 seconds to reach the bottom of the hill. How far, in inches, does it travel?

- (A) 215
- (B) 360
- (C) 2992
- (D) 3195
- (E) 3242

AMC 10A, 2021, Problem 5

The quiz scores of a class with $k > 12$ students have a mean of 8 . The mean of a collection of 12 of these quiz scores is 14 .

What is the mean of the remaining quiz scores in terms of k ?

- (A) $\frac{14-8}{k-12}$
- (B) $\frac{8k-168}{k-12}$
- (C) $\frac{14}{12} - \frac{8}{k}$
- (D) $\frac{14(k-12)}{k^2}$
- (E) $\frac{14(k-12)}{8k}$

AMC 10A, 2021, Problem 6

Chantal and Jean start hiking from a trailhead toward a fire tower. Jean is wearing a heavy backpack and walks slower. Chantal starts walking a 4 miles per hour. Halfway to the tower, the trail becomes really steep, and Chantal slows down to 2 miles per hour. After reaching the tower, she immediately turns around and descends the steep part of the trail at 3 miles per hour. She meets Jean at the halfway point. What was Jean's average speed, in miles per hour, until they meet?

- (A) $\frac{12}{13}$
- (B) 1
- (C) $\frac{13}{12}$
- (D) $\frac{24}{13}$
- (E) 2

AMC 10B, 2021, Problem 2

What is the value of $\sqrt{(3 - 2\sqrt{3})^2} + \sqrt{(3 + 2\sqrt{3})^2}$?

- (A) 0
- (B) $4\sqrt{3} - 6$



- (C) 6
- (D) $4\sqrt{3}$
- (E) $4\sqrt{3} + 6$

AMC 10B, 2021, Problem 15

The real number x satisfies the equation $x + \frac{1}{x} = \sqrt{5}$.

What is the value of $x^{11} - 7x^7 + x^3$?

- (A) -1
- (B) 0
- (C) 1
- (D) 2
- (E) $\sqrt{5}$

AMC 10A, 2020, Problem 22

Hiram's algebra notes are 50 pages long and are printed on 25 sheets of paper; the first sheet contains pages 1 and 2, the second sheet contains pages 3 and 4, and so on. One day he leaves his notes on the table before leaving for lunch, and his roommate decides to borrow some pages from the middle of the notes. When Hiram comes back, he discovers that his roommate has taken a consecutive set of sheets from the notes and that the average (mean) of the page numbers on all remaining sheets is exactly 19. How many sheets were borrowed?

- (A) 10
- (B) 13
- (C) 15
- (D) 17
- (E) 20

AMC 10A, 2020, Problem 1

What value of x satisfies $x - \frac{3}{4} = \frac{5}{12} - \frac{1}{3}$?

- (A) $-\frac{2}{3}$
- (B) $\frac{7}{36}$
- (C) $\frac{7}{12}$
- (D) $\frac{2}{3}$
- (E) $\frac{5}{6}$

AMC 10A, 2020, Problem 2

The numbers 3, 5, 7, a , and b have an average (arithmetic mean) of 15.

What is the average of a and b ?

- (A) 0
- (B) 15
- (C) 30
- (D) 45
- (E) 60

AMC 10A, 2020, Problem 3

Assuming $a \neq 3$, $b \neq 4$, and $c \neq 5$, what is the value in simplest form of the following expression?

$$\frac{a-3}{5-c} \cdot \frac{b-4}{3-a} \cdot \frac{c-5}{4-b}$$

- (A) -1
- (B) 1
- (C) $\frac{abc}{60}$
- (D) $\frac{1}{abc} - \frac{1}{60}$
- (E) $\frac{1}{60} - \frac{1}{abc}$

AMC 10A, 2020, Problem 5

What is the sum of all real numbers x for which $|x^2 - 12x + 34| = 2$?

- (A) 12
- (B) 15
- (C) 18
- (D) 21
- (E) 25

AMC 10A, 2020, Problem 14

Real numbers x and y satisfy $x + y = 4$ and $x \cdot y = -2$.

What is the value of $x + \frac{x^3}{y^2} + \frac{y^3}{x^2} + y$?

- (A) 360
- (B) 400
- (C) 420
- (D) 440
- (E) 480

AMC 10B, 2020, Problem 1

What is the value of

$$1 - (-2) - 3 - (-4) - 5 - (-6)?$$

- (A) -20
- (B) -3
- (C) 3
- (D) 5
- (E) 21

AMC 10B, 2020, Problem 3

The ratio of w to x is $4 : 3$, the ratio of y to z is $3 : 2$,

and the ratio of z to x is $1 : 6$. What is the ratio of w to y ?

- (A) $4 : 3$
- (B) $3 : 2$
- (C) $8 : 3$
- (D) $4 : 1$
- (E) $16 : 3$

AMC 10B, 2020, Problem 6

Driving along a highway, Megan noticed that her odometer showed 15951 (miles). This number is a palindrome-it reads the

same forward and backward. Then 2 hours later, the odometer displayed the next higher palindrome.

What was her average speed, in miles per hour, during this 2 hour period?

- (A) 50
- (B) 55
- (C) 60
- (D) 65
- (E) 70

AMC 10B, 2020, Problem 7

How many positive even multiples of 3 less than 2020 are perfect squares?

- (A) 7
- (B) 8
- (C) 9
- (D) 10
- (E) 12

AMC 10B, 2020, Problem 9

How many ordered pairs of integers (x, y) satisfy the equation

$$x^{2020} + y^2 = 2y?$$

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

AMC 10B, 2020, Problem 12

The decimal representation of

$$\frac{1}{20^{20}}$$

consists of a string of zeros after the decimal point, followed by a 9 and then several more digits.

How many zeros are in that initial string of zeros after the decimal point?

- (A) 23
- (B) 24
- (C) 25
- (D) 26
- (E) 27

AMC 10B, 2020, Problem 22

What is the remainder when $2^{202} + 202$ is divided by $2^{101} + 2^{51} + 1$?

- (A) 100
- (B) 101
- (C) 200
- (D) 201
- (E) 202

AMC 10A, 2019, Problem 1

What is the value of

$$\binom{\binom{19}{0}}{2} + \left(\binom{2^0}{1}\right)^9?$$

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4

AMC 10A, 2019, Problem 2

What is the hundreds digit of $(20! - 15!)$?

- (A) 0
- (B) 1
- (C) 2
- (D) 4
- (E) 5

AMC 10A, 2019, Problem 3

Ana and Bonita were born on the same date in different years, n years apart. Last year Ana was 5 times as old as Bonita. This year Ana's age is the square of Bonita's age. What is n ?

- (A) 3
- (B) 5
- (C) 9
- (D) 12
- (E) 15

AMC 10A, 2019, Problem 24

Let p , q , and r be the distinct roots of the polynomial $x^3 - 22x^2 + 80x - 67$. It is given that there exist real numbers A , B , and C such that

$$\frac{1}{s^3 - 22s^2 + 80s - 67} = \frac{A}{s-p} + \frac{B}{s-q} + \frac{C}{s-r}$$

for all $s \notin p, q, r$. What is $\frac{1}{A} + \frac{1}{B} + \frac{1}{C}$?

- (A) 243
- (B) 244
- (C) 245
- (D) 246
- (E) 247

AMC 10B, 2019, Problem 1

Alicia had two containers. The first was $\frac{5}{6}$ full of water and the second was empty. She poured all the water from the first container into the second container, at which point the second container was $\frac{3}{4}$ full of water. What is the ratio of the volume of the first container to the volume of the second container?

- (A) $\frac{5}{8}$



- (B) $\frac{4}{5}$
- (C) $\frac{7}{8}$
- (D) $\frac{9}{10}$
- (E) $\frac{11}{12}$

AMC 10B, 2019, Problem 2

Consider the statement, "If n is not prime, then $n - 2$ is prime." Which of the following values of n is a counterexample to this statement?

- (A) 11
- (B) 15
- (C) 19
- (D) 21
- (E) 27

AMC 10B, 2019, Problem 3

In a high school with 500 students, 40% of the seniors play a musical instrument, while 30% of the non-seniors do not play a musical instrument. In all, 46.8% of the students do not play a musical instrument. How many non-seniors play a musical instrument?

- (A) 66
- (B) 154
- (C) 186
- (D) 220
- (E) 266

AMC 10B, 2019, Problem 4

All lines with equation $ax + by = c$ such that a, b, c form an arithmetic progression pass through a common point. What are the coordinates of that point?

- (A) $(-1, 2)$
- (B) $(0, 1)$
- (C) $(1, -2)$
- (D) $(1, 0)$
- (E) $(1, 2)$

AMC 10B, 2019, Problem 11

Two jars each contain the same number of marbles, and every marble is either blue or green.

In Jar 1 the ratio of blue to green marbles is 9 : 1, and the ratio of blue to green marbles in Jar 2 is 8 : 1. There are 95 green marbles in all. How many more blue marbles are in Jar 1 than in Jar 2?

- (A) 5
- (B) 10
- (C) 25
- (D) 45
- (E) 50

AMC 10B, 2019, Problem 13

What is the sum of all real numbers x for which the median of the numbers 4, 6, 8, 17, and x is equal to the mean of those five numbers?

- (A) -5



- (B) 0
- (C) 5
- (D) $\frac{15}{4}$
- (E) $\frac{35}{4}$

AMC 10B, 2019, Problem 18

Henry decides one morning to do a workout, and he walks $\frac{3}{4}$ of the way from his home to his gym. The gym is 2 kilometers away from Henry's home. At that point, he changes his mind and walks $\frac{3}{4}$ of the way from where he is back toward home. When he reaches that point, he changes his mind again and walks $\frac{3}{4}$ of the distance from there back toward the gym. If Henry keeps changing his mind when he has walked $\frac{3}{4}$ of the distance toward either the gym or home from the point where he last changed his mind, he will get very close to walking back and forth between a point A kilometers from home and a point B kilometers from home. What is $|A - B|$?

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

AMC 10A, 2018, Problem 1

What is the value of

$$\left(\left((2 + 1)^{-1} + 1 \right)^{-1} + 1 \right)^{-1} + 1?$$

- (A) $\frac{5}{8}$
- (B) $\frac{11}{7}$
- (C) $\frac{8}{5}$
- (D) $\frac{18}{11}$
- (E) $\frac{15}{8}$

AMC 10A, 2018, Problem 2

Liliane has 50% more soda than Jacqueline, and Alice has 25% more soda than Jacqueline. What is the relationship between the amounts of soda that Liliane and Alice have?

- (A) Liliane has 20% more soda than Alice.
- (B) Liliane has 25% more soda than Alice.
- (C) Liliane has 45% more soda than Alice.
- (D) Liliane has 75% more soda than Alice.
- (E) Liliane has 100% more soda than Alice.

AMC 10A, 2018, Problem 3

A unit of blood expires after $10! = 10 \cdot 9 \cdot 8 \cdots 1$ seconds. Yasin donates a unit of blood at noon of January 1. On what day does his unit of blood expire?

- (A) January 2
- (B) January 12
- (C) January 22
- (D) February 11
- (E) February 12

AMC 10A, 2018, Problem 6

Sangho uploaded a video to a website where viewers can vote that they like or dislike a video. Each vote changes the score by 1, and the score starts at a score of 0, and the score increases by 1 for each like vote and decreases by 1 for each dislike vote. At one point, that his video had a score of 90, and that 65% of the votes cast on his video were like votes. How many votes were cast on Sangho's video at that point?

- (A) 200
- (B) 300
- (C) 400
- (D) 500
- (E) 600

AMC 10A, 2018, Problem 8

Joe has a collection of 23 coins, consisting of 5-cent coins, 10-cent coins, and 25-cent coins. He has 3 more 10-cent coins than 5-cent coins and the total value of his collection is 320 cents. How many more 25-cent coins does Joe have than 5-cent coins?

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4

AMC 10A, 2018, Problem 10

Suppose that real number x satisfies

$$\sqrt{49 - x^2} - \sqrt{25 - x^2} = 3$$

What is the value of $\sqrt{49 - x^2} + \sqrt{25 - x^2}$?

- (A) 8
- (B) $\sqrt{33} + 8$
- (C) 9
- (D) $2\sqrt{10} + 4$
- (E) 12

AMC 10B, 2018, Problem 1

Kate bakes a 20-inch by 18-inch pan of cornbread. The cornbread is cut into pieces that measure 2 inches by 2 inches. How many pieces of cornbread does the pan contain?

- (A) 90
- (B) 100
- (C) 180
- (D) 200
- (E) 360

AMC 10B, 2018, Problem 2

Sam drove 96 miles in 90 minutes. His average speed during the first 30 minutes was 60mph (miles per hour), and his average speed during the second 30 minutes was 65mph. What was his average speed, in mph, during the last 30 minutes?

- (A) 64
- (B) 65
- (C) 66



(D) 67

(E) 68

AMC 10A, 2018, Problem 4

A three-dimensional rectangular box with dimensions X , Y , and Z has faces whose surface areas are 24, 24, 48, and 72 square units. What is $X + Y + Z$?

(A) 18

(B) 22

(C) 24

(D) 30

(E) 36

AMC 10A, 2018, Problem 19

Joey and Chloe and their daughter Zoe all have the same birthday. Joey is 1 year older than Chloe, and Zoe is exactly 1 year old today. Today is the first of the 9 birthdays on which Chloe's age will be an integral multiple of Zoe's age. What will be the sum of the two digits of Joey's age the next time his age is a multiple of Zoe's age?

(A) 7

(B) 8

(C) 9

(D) 10

(E) 11

AMC 10A, 2017, Problem 1

What is the value of $(2(2(2(2(2(2 + 1) + 1) + 1) + 1) + 1) + 1)$?

(A) 70

(B) 97

(C) 127

(D) 159

(E) 729

AMC 10A, 2017, Problem 2

Pablo buys popsicles for his friends. The store sells single popsicles for \$1 each, 3-popsicle boxes for \$2 each, and 5-popsicle boxes for \$3. What is the greatest number of popsicles that Pablo can buy with \$8 ?

(A) 8

(B) 11

(C) 12

(D) 13

(E) 15

AMC 10A, 2017, Problem 4

Mia is "helping" her mom pick up 30 toys that are strewn on the floor. Mia's mom manages to put 3 toys into the toy box every 30 seconds, but each time immediately after those 30 seconds have elapsed, Mia takes 2 toys out of the box. How much time, in minutes, will it take Mia and her mom to put all 30 toys into the box for the first time?

(A) 13.5

(B) 14

(C) 14.5

(D) 15



(E) 15.5

AMC 10A, 2017, Problem 5

The sum of two nonzero real numbers is 4 times their product. What is the sum of the reciprocals of the two .

- (A) 1
- (B) 2
- (C) 4
- (D) 8
- (E) 12

AMC 10A, 2017, Problem 9

Minnie rides on a flat road at 20 kilometers per hour (kph), downhill at 30kph, and uphill at 5kph. Penny rides on a flat road at 30kph, downhill at 40kph, and uphill at 10kph. Minnie goes from town A to town B , a distance of 10 km all uphill, then from town B to town C , a distance of 15 km all downhill, and then back to town A , a distance of 20 km on the flat. Penny goes the other way around using the same route. How many more minutes does it take Minnie to complete the 45 -km ride than it takes Penny?

- (A) 45
- (B) 60
- (C) 65
- (D) 90
- (E) 95

AMC 10A, 2017, Problem 10

Joy has 30 thin rods, one each of every integer length from 1 cm through 30 cm. She places the rods with lengths 3 cm, 7 cm, and 15 cm on a table. She then wants to choose a fourth rod that she can put with these three to form a quadrilateral with positive area. How many of the remaining rods can she choose as the fourth rod?

- (A) 16
- (B) 17
- (C) 18
- (D) 19
- (E) 20

AMC 10A, 2017, Problem 14

Every week Roger pays for a movie ticket and a soda out of his allowance. Last week, Roger's allowance was A dollars. The cost of his movie ticket was 20% of the difference between A and the cost of his soda, while the cost of his soda was 5% of the difference between A and the cost of his movie ticket. To the nearest whole percent, what fraction of A did Roger pay for his movie ticket and soda?

- (A) 9%
- (B) 19%
- (C) 22%
- (D) 23%
- (E) 25%

AMC 10A, 2017, Problem 16

There are 10 horses, named Horse 1, Horse 2, $\dots$, Horse 10. They get their names from how many minutes it takes them to run one lap around a circular race track: Horse k runs one lap in exactly k minutes. At time 0 all the horses are together at the starting point on the track. The horses start running in the same direction, and they keep running around the circular



track at their constant speeds. The least time $S > 0$, in minutes, at which all 10 horses will again start at the same starting point is $S = 2520$. Let $T > 0$ be the least time, in minutes, such that at least 5 of the horses will again start at the same starting point. What is the sum of the digits of T ?

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

AMC 10B, 2017, Problem 1

Mary thought of a positive two-digit number. She multiplied it by 3 and added 11. Then she switched the digits of the result, obtaining a number between 71 and 75, inclusive. What was Mary's number?

- (A) 11
- (B) 12
- (C) 13
- (D) 14
- (E) 15

AMC 10B, 2017, Problem 2

Sofia ran 5 laps around the 400-meter track at her school. For each lap, she ran the first 100 meters at an average speed of 4 meters per second and the remaining 300 meters at an average speed of 5 meters per second. How much time did Sofia take running the 5 laps?

- (A) 5 minutes and 35 seconds
- (B) 6 minutes and 40 seconds
- (C) 7 minutes and 5 seconds
- (D) 7 minutes and 25 seconds
- (E) 8 minutes and 10 seconds

AMC 10B, 2017, Problem 3

Real numbers x , y , and z satisfy the inequalities $0 < x < 1$, $-1 < y < 0$, and $1 < z < 2$. Which of the following numbers is necessarily positive?

- (A) $y + x^2$
- (B) $y + xz$
- (C) $y + y^2$
- (D) $y + 2y^2$
- (E) $y + z$

AMC 10B, 2017, Problem 4

Supposed that x and y are nonzero real numbers such that $\frac{3x+y}{x-3y} = -2$. What is the value of $\frac{x+3y}{3x-y}$?

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

AMC 10B, 2017, Problem 5

Camilla had twice as many blueberry jelly beans as cherry jelly beans. After eating 10 pieces of each kind, she now has



three times as many blueberry jelly beans as cherry jelly beans. How many blueberry jelly beans are there?

- (A) 10
- (B) 20
- (C) 30
- (D) 40
- (E) 50

AMC 10B, 2017, Problem 7

Samia set off on her bicycle to visit her friend, traveling at an average speed of 17 kilometers per hour. When she had gone half the distance to her friend's house, a tire went flat, and she walked the rest of the way at 5 kilometers per hour. In all it took her 44 minutes to reach her friend's house. In kilometers rounded to the nearest tenth, how far did Samia walk?

- (A) 2.0
- (B) 2.2
- (C) 2.8
- (D) 3.4
- (E) 4.4

AMC 10B, 2017, Problem 10

The lines with equations $ax - 2y = c$ and $2x + by = -c$ are perpendicular and intersect at $(1, -5)$. What is c ?

- (A) -13
- (B) -8
- (C) 2
- (D) 8
- (E) 13

AMC 10B, 2017, Problem 11

At Typico High School, 60% of the students like dancing, and the rest dislike it. Of those who like dancing, 80% say that they like it, and the rest say that they dislike it. Of those who dislike dancing, 90% say that they dislike it, and the rest say that they like it. What fraction of students who say they dislike dancing actually like it?

- (A) 10%
- (B) 12%
- (C) 20%
- (D) 25%
- (E) $33\frac{1}{3}\%$

AMC 10B, 2017, Problem 12

Elmer's new car gives 50% percent better fuel efficiency, measured in kilometers per liter, than his old car. However, his new car uses diesel fuel which is 20% more expensive per liter than the gasoline his old car used. By what percent will Elmer save money if he uses his new car instead of his old car for a long trip?

- (A) 20%
- (B) $26\frac{2}{3}\%$
- (C) $27\frac{7}{9}\%$
- (D) $33\frac{1}{3}\%$
- (E) $66\frac{2}{3}\%$

AMC 10B, 2017, Problem 13

There are 20 students participating in an after-school program offering classes in yoga, bridge, and painting. Each student



must take at least one of these three classes, but may take two or all three. There are 10 students taking bridge, and 9 taking painting. There are 9 students taking at least two classes. How many students are taking at least one class?

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

AMC 10A, 2016, Problem 1

What is the value of $\frac{11! - 10!}{9!}$?

- (A) 99
- (B) 100
- (C) 110
- (D) 121
- (E) 132

AMC 10A, 2016, Problem 2

For what value of x does $10^x \cdot 100^{2x} = 1000^5$?

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

AMC 10A, 2016, Problem 3

For every dollar Ben spent on bagels, David spent 25 cents less. Ben paid \$12.50 more than David. How much did they spend in the bagel store together?

- (A) \$37.50
- (B) \$50.00
- (C) \$87.50
- (D) \$90.00
- (E) \$92.50

AMC 10A, 2016, Problem 5

A rectangular box has integer side lengths in the ratio 1 : 3 : 4. Which of the following could be the volume of the box?

- (A) 48
- (B) 56
- (C) 64
- (D) 96
- (E) 144

AMC 10A, 2016, Problem 6

Ximena lists the whole numbers 1 through 30 once. Emilio copies Ximena's numbers, replacing each occurrence of the digit 2 by the digit 1. Ximena adds her numbers and Emilio adds his numbers. How much larger is Ximena's sum than Emilio's?

- (A) 13
- (B) 26



- (C) 102
- (D) 103
- (E) 110

AMC 10A, 2016, Problem 7

The mean, median, and mode of the 7 data values 60, 100, x , 40, 50, 200, 90 are all equal to x . What is the value of x

- (A) 50
- (B) 60
- (C) 75
- (D) 90
- (E) 100

AMC 10A, 2016, Problem 8

Trickster Rabbit agrees with Foolish Fox to double Fox's money every time Fox crosses the bridge by Rabbit's house, as long as Fox pays 40 coins in toll to Rabbit after each crossing. The payment is made after the doubling, Fox is excited about his good fortune until he discovers that all his money is gone after crossing the bridge three times. How many coins did Fox have at the beginning?

- (A) 20
- (B) 30
- (C) 35
- (D) 40
- (E) 45

AMC 10B, 2016, Problem 1

What is the value of $\frac{2a^{-1} + \frac{a^{-1}}{2}}{a}$ when $a = \frac{1}{2}$?

- (A) 1
- (B) 2
- (C) $\frac{5}{2}$
- (D) 10
- (E) 20

AMC 10B, 2016, Problem 3

Let $x = -2016$. What is the value of $||x| - x| - |x|| - x$?

- (A) -2016
- (B) 0
- (C) 2016
- (D) 4032
- (E) 6048

AMC 10B, 2016, Problem 5

The mean age of Amanda's 4 cousins is 8 , and their median age is 5 . What is the sum of the ages of Amanda's youngest and oldest cousins?

- (A) 13
- (B) 16
- (C) 19
- (D) 22

(E) 25

AMC 10B, 2016, Problem 6

Laura added two three-digit positive integers. All six digits in these numbers are different. Laura's sum is a 3-digit number S . What is the smallest possible value for the sum of the digits of S ?

- (A) 1
- (B) 4
- (C) 5
- (D) 15
- (E) 20

AMC 10B, 2016, Problem 7

The ratio of the measures of two acute angles is $5 : 4$, and the complement of one of these two angles is twice as large as the complement of the other. What is the sum of the degree measures of the two angles?

- (A) 75
- (B) 90
- (C) 135
- (D) 150
- (E) 270

AMC 10B, 2016, Problem 8

What is the tens digit of $2015^{2016} - 2017$?

- (A) 0
- (B) 1
- (C) 3
- (D) 5
- (E) 8

AMC 10B, 2016, Problem 10

A thin piece of wood of uniform density in the shape of an equilateral triangle with side length 3 inches weighs 12 ounces. A second piece of the same type of wood, with the same thickness, also in the shape of an equilateral triangle, has side length of 5 inches. Which of the following is closest to the weight, in ounces, of the second piece?

- (A) 14.0
- (B) 16.0
- (C) 20.0
- (D) 33.3
- (E) 55.6

AMC 10B, 2016, Problem 13

At Megapolis Hospital one year, multiple-birth statistics were as follows: Sets of twins, triplets, and quadruplets accounted for 1000 of the babies born. There were four times as many sets of triplets as sets of quadruplets, and there was three times as many sets of twins as sets of triplets. How many of these 1000 babies were in sets of quadruplets?

- (A) 25
- (B) 40
- (C) 64
- (D) 100
- (E) 160

AMC 10B, 2016, Problem 16

The sum of an infinite geometric series is a positive number S , and the second term in the series is 1. What is a possible value of S ?

- (A) $\frac{1+\sqrt{5}}{2}$
- (B) 2
- (C) $\sqrt{5}$
- (D) 3
- (E) 4

AMC 10A, 2015, Problem 1

What is the value of $(2^0 - 1 + 5^2 - 0)^{-1} \times 5$?

- (A) -125
- (B) -120
- (C) $\frac{1}{5}$
- (D) $\frac{5}{24}$
- (E) 25

AMC 10A, 2015, Problem 2

A box contains a collection of triangular and square tiles. There are 25 tiles in the box, containing 84 edges total. How many square tiles are there in the box?

- (A) 3
- (B) 5
- (C) 7
- (D) 9
- (E) 11

AMC 10A, 2015, Problem 4

Pablo, Sofia, and Mia got some candy eggs at a party. Pablo had three times as many eggs as Sofia, and Sofia had twice as many eggs as Mia. Pablo decides to give some of his eggs to Sofia and Mia so that all three will have the same number of eggs. What fraction of his eggs should Pablo give to Sofia?

- (A) $\frac{1}{12}$
- (B) $\frac{1}{6}$
- (C) $\frac{1}{4}$
- (D) $\frac{1}{3}$
- (E) $\frac{1}{2}$

AMC 10A, 2015, Problem 5

Mr. Patrick teaches math to 15 students. He was grading tests and found that when he graded everyone's test except Payton's, the average grade for the class was 80. After he graded Payton's test, the test average became 81. What was Payton's score on the test?

- (A) 81
- (B) 85
- (C) 91
- (D) 94
- (E) 95



AMC 10A, 2015, Problem 6

The sum of two positive numbers is 5 times their difference. What is the ratio of the larger number to

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

AMC 10A, 2015, Problem 7

How many terms are in the arithmetic sequence $13, 16, 19, \dots, 70, 73$?

- (A) 20
- (B) 21
- (C) 24
- (D) 60
- (E) 61

AMC 10A, 2015, Problem 8

Two years ago Pete was three times as old as his cousin Claire. Two years before that, Pete was four times as old as Claire.

In how many years will the ratio of their ages be $2 : 1$?

- (A) 2
- (B) 4
- (C) 5
- (D) 6
- (E) 8

AMC 10A, 2015, Problem 11

The ratio of the length to the width of a rectangle is $4 : 3$. If the rectangle has diagonal of length d , then the area may be expressed as kd^2 for some constant k . What is k ?

- (A) $\frac{2}{7}$
- (B) $\frac{3}{7}$
- (C) $\frac{12}{25}$
- (D) $\frac{16}{25}$
- (E) $\frac{3}{4}$

AMC 10A, 2015, Problem 12

Points $(\sqrt{\pi}, a)$ and $(\sqrt{\pi}, b)$ are distinct points on the graph of $y^2 + x^4 = 2x^2y + 1$. What is $|a - b|$?

- (A) 1
- (B) $\frac{\pi}{2}$
- (C) 2
- (D) $\sqrt{1 + \pi}$
- (E) $1 + \sqrt{\pi}$

AMC 10A, 2015, Problem 15

Consider the set of all fractions $\frac{x}{y}$, where x and y are relatively prime positive integers. How many of these fractions have the property that if both numerator and denominator are increased by 1, the value of the fraction is increased by 10% ?

- (A) 0
- (B) 1

- (C) 2
- (D) 3
- (E) infinitely many

AMC 10A, 2015, Problem 16

If $y + 4 = (x - 2)^2$, $x + 4 = (y - 2)^2$, and $x \neq y$, what is the value of $x^2 + y^2$?

- (A) 10
- (B) 15
- (C) 20
- (D) 25
- (E) 30

AMC 10B, 2015, Problem 1

What is the value of $2 - (-2)^{-2}$?

- (A) -2
- (B) $\frac{1}{16}$
- (C) $\frac{7}{4}$
- (D) $\frac{9}{4}$
- (E) 6

AMC 10B, 2015, Problem 2

Marie does three equally time-consuming tasks in a row without taking breaks. She begins the first task at 1 : 00PM and finishes the second task at 2 : 40PM. When does she finish the third task?

- (A) 3 : 10 PM
- (B) 3 : 30 PM
- (C) 4 : 00 PM
- (D) 4 : 10 PM
- (E) 4 : 30 PM

AMC 10B, 2015, Problem 3

Kaashish has written down one integer two times and another integer three times. The sum of the five numbers is 100 , and one of the numbers is 28 . What is the other number?

- (A) 8
- (B) 11
- (C) 14
- (D) 15
- (E) 18

AMC 10B, 2015, Problem 7

Consider the operation "minus the reciprocal of," defined by $a \diamond b = a - \frac{1}{b}$. What is $((1 \diamond 2) \diamond 3) - (1 \diamond (2 \diamond 3))$?

- (A) $-\frac{7}{30}$
- (B) $-\frac{1}{6}$
- (C) 0
- (D) $\frac{1}{6}$
- (E) $\frac{7}{30}$

AMC 10B, 2015, Problem 13

The line $12x + 5y = 60$ forms a triangle with the coordinate axes. What is the sum of the lengths of the triangle?

- (A) 20
- (B) $\frac{360}{17}$
- (C) $\frac{107}{5}$
- (D) $\frac{43}{2}$
- (E) $\frac{281}{13}$

AMC 10B, 2015, Problem 14

Let a , b , and c be three distinct one-digit numbers. What is the maximum value of the sum of the roots of the equation $(x - a)(x - b) + (x - b)(x - c) = 0$?

- (A) 15
- (B) 15.5
- (C) 16
- (D) 16.5
- (E) 17

AMC 10A, 2014, Problem 1

What is $10 \cdot \left(\frac{1}{2} + \frac{1}{5} + \frac{1}{10}\right)^{-1}$?

- (A) 3
- (B) 8
- (C) $\frac{25}{2}$
- (D) $\frac{170}{3}$
- (E) 170

AMC 10A, 2014, Problem 3

Bridget bakes 48 loaves of bread for her bakery. She sells half of them in the morning for \$2.50 each. In the afternoon she sells two thirds of what she has left, and because they are not fresh, she charges only half price. In the late afternoon she sells the remaining loaves at a dollar each. Each loaf costs \$0.75 for her to make. In dollars, what is her profit for the day?

- (A) 24
- (B) 36
- (C) 44
- (D) 48
- (E) 52

AMC 10A, 2014, Problem 5

On an algebra quiz, 10% of the students scored 70 points, 35% scored 80 points, 30% scored 90 points, and the rest scored 100 points. What is the difference between the mean and median score of the students' scores on this quiz?

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

AMC 10A, 2014, Problem 7

Nonzero real numbers x , y , a , and b satisfy $x < a$ and $y < b$. How many of the following inequalities must be true?

- (I) $x + y < a + b$
- (II) $x - y < a - b$
- (III) $xy < ab$
- (IV) $\frac{x}{y} < \frac{a}{b}$
- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4

AMC 10A, 2014, Problem 8

Which of the following numbers is a perfect square?

- (A) $\frac{14!15!}{2}$
- (B) $\frac{15!16!}{2}$
- (C) $\frac{16!17!}{2}$
- (D) $\frac{17!18!}{2}$
- (E) $\frac{18!19!}{2}$

AMC 10A, 2014, Problem 10

Five positive consecutive integers starting with a have average b . What is the average of 5 consecutive integers that start with b ?

- (A) $a + 3$
- (B) $a + 4$
- (C) $a + 5$
- (D) $a + 6$
- (E) $a + 7$

AMC 10A, 2014, Problem 11

A customer who intends to purchase an appliance has three coupons, only one of which may be used:

Coupon 1: 10% off the listed price if the listed price is at least \$50

Coupon 2: \$20 off the listed price if the listed price is at least \$100

Coupon 3: 18% off the amount by which the listed price exceeds \$100

For which of the following listed prices will coupon 1 offer a greater price reduction than either coupon 2 or coupon 3 ?

- (A) \$179.95
- (B) \$199.95
- (C) \$219.95
- (D) \$239.95
- (E) \$259.95

AMC 10A, 2014, Problem 15

David drives from his home to the airport to catch a flight. He drives 35 miles in the first hour, but realizes that he will be 1 hour late if he continues at this speed. He increases his speed by 15 miles per hour for the rest of the way to the airport and arrives 30 minutes early. How many miles is the airport from his home?

- (A) 140
- (B) 175
- (C) 210
- (D) 245

(E) 280

AMC 10B, 2014, Problem 1

Leah has 13 coins, all of which are pennies and nickels. If she had one more nickel than she has now, then she the same number of pennies and nickels. In cents, how much are Leah's coins worth?

- (A) 33
- (B) 35
- (C) 37
- (D) 39
- (E) 41

AMC 10B, 2014, Problem 2

What is $\frac{2^3+2^3}{2^{-3}+2^{-3}}$?

- (A) 16
- (B) 24
- (C) 32
- (D) 48
- (E) 64

AMC 10B, 2014, Problem 3

Randy drove the first third of his trip on a gravel road, the next 20 miles on pavement, and the remaining one-fifth on a dirt road. In miles how long was Randy's trip?

- (A) 30
- (B) $\frac{400}{11}$
- (C) $\frac{75}{2}$
- (D) 40
- (E) $\frac{300}{7}$

AMC 10B, 2014, Problem 4

Susie pays for 4 muffins and 3 bananas. Calvin spends twice as much paying for 2 muffins and 16 bananas. A muffin is how many times as expensive as a banana?

- (A) $\frac{3}{2}$
- (B) $\frac{5}{3}$
- (C) $\frac{7}{4}$
- (D) 2
- (E) $\frac{13}{4}$

AMC 10B, 2014, Problem 6

Orvin went to the store with just enough money to buy 30 balloons. When he arrived, he discovered that the store had a special sale on balloons:

buy 1 balloon at the regular price and get a second at $\frac{1}{3}$ off the regular price. What is the greatest number of balloons Orvin could buy?

- (A) 33
- (B) 34
- (C) 36
- (D) 38
- (E) 39



AMC 10B, 2014, Problem 7

Suppose $A > B > 0$ and A is $x\%$ greater than B . What is x ?

- (A) $100 \left(\frac{A-B}{B} \right)$
- (B) $100 \left(\frac{A+B}{B} \right)$
- (C) $100 \left(\frac{A+B}{A} \right)$
- (D) $100 \left(\frac{A-B}{A} \right)$
- (E) $100 \left(\frac{A}{B} \right)$

AMC 10B, 2014, Problem 8

A truck travels $\frac{b}{6}$ feet every t seconds. There are 3 feet in a yard. How many yards does the truck travel in 3 minutes?

- (A) $\frac{b}{1080t}$
- (B) $\frac{30t}{b}$
- (C) $\frac{30b}{t}$
- (D) $\frac{10t}{b}$
- (E) $\frac{10b}{t}$

AMC 10B, 2014, Problem 9

For real numbers w and z ,

$$\frac{\frac{1}{w} + \frac{1}{z}}{\frac{1}{w} - \frac{1}{z}} = 2014.$$

What is $\frac{w+z}{w-z}$?

- (A) -2014
- (B) $\frac{-1}{2014}$
- (C) $\frac{1}{2014}$
- (D) 1
- (E) 2014

AMC 10A, 2013, Problem 1

A taxi ride costs \$1.50 plus \$0.25 per mile traveled. How much does a 5 -mile taxi ride cost?

- (A) 2.25
- (B) 2.50
- (C) 2.75
- (D) 3.00
- (E) 3.75

AMC 10A, 2013, Problem 2

Alice is making a batch of cookies and needs $2\frac{1}{2}$ cups of sugar. Unfortunately, her measuring cup holds only $\frac{1}{4}$ cup of sugar. How many times must she fill that cup to get the correct amount of sugar?

- (A) 8
- (B) 10
- (C) 12
- (D) 16
- (E) 20

AMC 10A, 2013, Problem 5



Tom, Dorothy, and Sammy went on a vacation and agreed to split the costs evenly. During their trip, Dorothy paid \$125, and Sammy paid \$175. In order to share costs equally, Tom gave Sammy t dollars and Dorothy gave Sammy d dollars. What is $t - d$?

- (A) 15
- (B) 20
- (C) 25
- (D) 30
- (E) 35

AMC 10A, 2013, Problem 6

Joey and his five brothers are ages 3, 5, 7, 9, 11, and 13. One afternoon two of his brothers whose ages sum to 16 went to the movies, two brothers younger than 10 went to play baseball, and Joey and the 5-year-old stayed home. How old is Joey?

- (A) 3
- (B) 7
- (C) 9
- (D) 11
- (E) 13

AMC 10A, 2013, Problem 8

What is the value of

$$\frac{2^{2014} + 2^{2012}}{2^{2014} - 2^{2012}}?$$

- (A) -1
- (B) 1
- (C) $\frac{5}{3}$
- (D) 2013
- (E) 2^{4024}

AMC 10A, 2013, Problem 9

In a recent basketball game, Shenille attempted only three-point shots and two-point shots. She was successful on 20% of her three-point shots and 30% of her two-point shots. Shenille attempted 30 shots. How many points did she score?

- (A) 12
- (B) 18
- (C) 24
- (D) 30
- (E) 36

AMC 10A, 2013, Problem 10

A flower bouquet contains pink roses, red roses, pink carnations, and red carnations. One third of the pink flowers are roses, three fourths of the red flowers are carnations, and six tenths of the flowers are pink. What percent of the flowers are carnations?

- (A) 15
- (B) 30
- (C) 40



(D) 70

(E) 60

AMC 10A, 2013, Problem 14

A solid cube of side length 1 is removed from each corner of a solid cube of side length 3 . How many edges does the remaining solid have?

(A) 36

(B) 60

(C) 72

(D) 84

(E) 108

AMC 10B, 2013, Problem 1

What is $\frac{2+4+6}{1+3+5} - \frac{1+3+5}{2+4+6}$?

(A) $\frac{7}{12}$

(B) $\frac{49}{20}$

(C) $\frac{43}{3}$

(D) $\frac{5}{36}$

(E) -1

AMC 10B, 2013, Problem 2

Mr. Green measures his rectangular garden by walking two of the sides and finds that it is 15 steps by 20 steps. Each of Mr. Green's steps is 2 feet long. Mr. Green expects a half a pound of potatoes per square foot from his garden. How many pounds of potatoes does Mr. Green expect from his garden?

(A) 600

(B) 800

(C) 1000

(D) 1200

(E) 1400

AMC 10B, 2013, Problem 10

A basketball team's players were successful on 50% of their two-point shots and 40% of their three-point shots, which resulted in 54 points. They attempted 50% more two-point shots than three-point shots. How many three-point shots did they attempt?

(A) 10

(B) 15

(C) 20

(D) 25

(E) 30

AMC 10B, 2013, Problem 15



A wire is cut into two pieces, one of length a and the other of length b . The piece of length a is bent into a triangle, and the piece of length b is bent to form a regular hexagon. The triangle and the hexagon have the same perimeter. What is the value of $\frac{a}{b}$?

- (A) 1
- (B) $\frac{6}{2}$
- (C) $3\sqrt{2}$
- (D) 8
- (E) 10

AMC 10A, 2012, Problem 1

Cagney can frost a cupcake every 20 seconds and Lacey can frost a cupcake every 30 seconds. Working together, how many cupcakes can they frost in 5 minutes?

- (A) 10
- (B) 15
- (C) 20
- (D) 25
- (E) 30

AMC 10A, 2012, Problem 3

A bug crawls along a number line, starting at -2 . It crawls to -6 , then turns around and crawls to 5 . How many units does the bug crawl altogether?

- (A) 9
- (B) 11
- (C) 13
- (D) 14
- (E) 15

AMC 10A, 2012, Problem 5

Last year 100 adult cats, half of whom were female, were brought into the Smallville Animal Shelter. Half of the adult female cats were accompanied by a litter of kittens. The average number of kittens per litter was 4. What was the total number of cats and kittens received by the shelter last year?

- (A) 150
- (B) 200
- (C) 250
- (D) 300
- (E) 400

AMC 10A, 2012, Problem 6

The product of two positive numbers is 9. The reciprocal of one of these numbers is 4 times the reciprocal of the other number. What is the sum of the two numbers?

- (A) $\frac{10}{3}$
- (B) $\frac{20}{3}$
- (C) 7

- (D) $\frac{15}{2}$
(E) 8

AMC 10A, 2012, Problem 7

In a bag of marbles, $\frac{3}{5}$ of the marbles are blue and the rest are red. If the number of red marbles is doubled and the number of blue marbles stays the same, what fraction of the marbles will be red?

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

AMC 10A, 2012, Problem 8

The sums of three whole numbers taken in pairs are 12, 17, and 19. What is the middle number?

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

AMC 10A, 2012, Problem 10

Mary divides a circle into 12 sectors. The central angles of these sectors, measured in degrees, are all integers and they form an arithmetic sequence. What is the degree measure of the smallest possible sector angle?

- (A) 5
(B) 6
(C) 8
(D) 10
(E) 12

AMC 10A, 2012, Problem 13

An iterative average of the numbers 1, 2, 3, 4, and 5 is computed the following way. Arrange the five numbers in some order. Find the mean of the first two numbers, then find the mean of that with the third number, then the mean of that with the fourth number, and finally the mean of that with the fifth number. What is the difference between the largest and smallest possible values that can be obtained using this procedure?

- (A) $\frac{31}{16}$
(B) 2
(C) $\frac{17}{8}$
(D) 3
(E) $\frac{65}{16}$

AMC 10A, 2012, Problem 14

Chubby makes nonstandard checkerboards that have 31 squares on each side. The checkerboards have a black square in every corner and alternate red and black squares along every row and column. How many black squares are there on such a checkerboard?

- (A) 480
(B) 481



- (C) 482
- (D) 483
- (E) 484

AMC 10A, 2012, Problem 16

Three runners start running simultaneously from the same point on a 500-meter circular track. They each run clockwise around the course maintaining constant speeds of 4.4, 4.8, and 5.0 meters per second. The runners stop once they are all together again somewhere on the circular course. How many seconds do the runners run?

- (A) 1, 000
- (B) 1, 250
- (C) 2, 500
- (D) 5, 000
- (E) 10, 000

AMC 10A, 2012, Problem 17

Let a and b be relatively prime positive integers with $a > b > 0$ and $\frac{a^3 - b^3}{(a - b)^3} = \frac{73}{3}$. What is $a - b$?

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

AMC 10A, 2012, Problem 19

Paula the painter and her two helpers each paint at constant, but different, rates. They always start at 8 : 00AM, and all three always take the same amount of time to eat lunch. On Monday the three of them painted 50% of a house, quitting at 4 : 00 PM. On Tuesday, when Paula wasn't there, the two helpers painted only 24% of the house and quit at 2:12 PM. On Wednesday Paula worked by herself and finished the house by working until 7:12 P.M. How long, in minutes, was each day's lunch break?

- (A) 30
- (B) 36
- (C) 42
- (D) 48
- (E) 60

AMC 10B, 2012, Problem 1

Each third-grade classroom at Pearl Creek Elementary has 18 students and 2 pet rabbits. How many more students than rabbits are there in all of the third-grade classrooms?

- (A) 48
- (B) 56
- (C) 64
- (D) 72
- (E) 80

AMC 10B, 2012, Problem 4

When Ringo places his marbles into bags with 6 marbles per bag, he has 4 marbles left over. When Paul does the same with his marbles, he has 3 marbles left over. Ringo and Paul pool their marbles and place them into as many bags as possible, with 6 marbles per bag. How many marbles will be leftover?

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

AMC 10B, 2012, Problem 5

Anna enjoys dinner at a restaurant in Washington, D.C., where the sales tax on meals is 10%. She leaves a 15% tip on the price of her meal before the sales tax is added, and the tax is calculated on the pre-tip amount. She spends a total of 27.50 dollars for dinner. What is the cost of her dinner without tax or tip in dollars?

- (A) 18
- (B) 20
- (C) 21
- (D) 22
- (E) 24

AMC 10B, 2012, Problem 7

For a science project, Sammy observed a chipmunk and a squirrel stashing acorns in holes. The chipmunk hid 3 acorns in each of the holes it dug. The squirrel hid 4 acorns in each of the holes it dug. They each hid the same number of acorns, although the squirrel needed 4 fewer holes. How many acorns did the chipmunk hide?

- (A) 30
- (B) 36
- (C) 42
- (D) 48
- (E) 54

AMC 10B, 2012, Problem 9

Two integers have a sum of 26 . When two more integers are added to the first two integers the sum is 41 . Finally when two more integers are added to the sum of the previous four integers the sum is 57. What is the minimum number of odd integers among the 6 integers?

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

AMC 10B, 2012, Problem 10

How many ordered pairs of positive integers (M, N) satisfy the equation $\frac{M}{6} = \frac{6}{N}$?

- (A) 6
- (B) 7
- (C) 8
- (D) 9
- (E) 10

AMC 10B, 2012, Problem 13

It takes Clea 60 seconds to walk down an escalator when it is not operating, and only 24 seconds to walk down the escalator when it is operating. How many seconds does it take Clea to ride down the operating escalator when she just

stands on it?

- (A) 36
- (B) 40
- (C) 42
- (D) 48
- (E) 52

AMC 10B, 2012, Problem 17

Jesse cuts a circular paper disk of radius 12 along two radii to form two sectors, the smaller having a central angle of 120 degrees. He makes two circular cones, using each sector to form the lateral surface of a cone. What is the ratio of the volume of the smaller cone to that of the larger?

- (A) $\frac{1}{8}$
- (B) $\frac{1}{4}$
- (C) $\frac{\sqrt{10}}{10}$
- (D) $\frac{\sqrt{5}}{6}$
- (E) $\frac{\sqrt{5}}{5}$

AMC 10A, 2011, Problem 1

A cell phone plan costs 20 dollars each month, plus 5 cents per text message sent, plus 10 cents for each minute used over 30 hours. In January Michelle sent 100 text messages and talked for 30.5 hours. How much did she have to pay?

- (A) 24.00
- (B) 24.50
- (C) 25.50
- (D) 28.00
- (E) 30.00

AMC 10A, 2011, Problem 2

A small bottle of shampoo can hold 35 milliliters of shampoo, whereas a large bottle can hold 500 milliliters of shampoo. Jasmine wants to buy the minimum number of small bottles necessary to completely fill a large bottle. How many bottles must she buy?

- (A) 11
- (B) 12
- (C) 13
- (D) 14
- (E) 15

AMC 10A, 2011, Problem 3

Suppose $[ab]$ denotes the average of a and b , and abc denotes the average of a , b , and c . What is $110[01]0$?

- (A) $\frac{2}{9}$
- (B) $\frac{5}{18}$
- (C) $\frac{1}{3}$
- (D) $\frac{7}{18}$
- (E) $\frac{2}{3}$

AMC 10A, 2011, Problem 4



AMC 10A, 2011, Problem 4

Let X and Y be the following sums of arithmetic sequences:

\$\$

$$X = 10 + 12 + 14 + \cdots + 100$$

$$Y = 12 + 14 + 16 + \cdots + 102$$

\$\$

What is the value of $Y - X$?

- (A) 92
- (B) 98
- (C) 100
- (D) 102
- (E) 112

AMC 10A, 2011, Problem 6

Set A has 20 elements, and set B has 15 elements. What is the smallest possible number of elements in $A \cup B$?

- (A) 5
- (B) 15
- (C) 20
- (D) 35
- (E) 300

AMC 10A, 2011, Problem 7

Which of the following equations does NOT have a solution?

- (A) $(x + 7)^2 = 0$
- (B) $|-3x| + 5 = 0$
- (C) $\sqrt{-x} - 2 = 0$
- (D) $\sqrt{x} - 8 = 0$
- (E) $|-3x| - 4 = 0$

AMC 10A, 2011, Problem 8

Last summer 30% of the birds living on Town Lake were geese, 25% were swans, 10% were herons, and 35% were ducks. What percent of the birds that were not swans were geese?

- (A) 20
- (B) 30
- (C) 40
- (D) 50
- (E) 60

AMC 10A, 2011, Problem 10

A majority of the 30 students in Ms. Demeanor's class bought pencils at the school bookstore. Each of these students bought the same number of pencils, and this number was greater than 1. The cost of a pencil in cents was greater than the number of pencils each student bought, and the total cost of all the pencils was \$17.71. What was the cost of a pencil in cents?

- (A) 7
- (B) 11
- (C) 17



(D) 23

(E) 77

AMC 10A, 2011, Problem 11

Square $EFGH$ has one vertex on each side of square $ABCD$. Point E is on AB with $AE = 7 \cdot EB$. What is the ratio of the area of $EFGH$ to the area of $ABCD$?

- (A) $\frac{49}{64}$
(B) $\frac{25}{32}$
(C) $\frac{7}{8}$
(D) $\frac{5\sqrt{2}}{8}$
(E) $\frac{\sqrt{14}}{4}$

AMC 10A, 2011, Problem 12

The players on a basketball team made some three-point shots, some two-point shots, and some one-point free throws. They scored as many points with two-point shots as with three-point shots. Their number of successful free throws was one more than their number of successful two-point shots. The team's total score was 61 points. How many free throws did they make?

- (A) 13
(B) 14
(C) 15
(D) 16
(E) 17

AMC 10A, 2011, Problem 15

Roy bought a new battery-gasoline hybrid car. On a trip the car ran exclusively on its battery for the first 40 miles, then ran exclusively on gasoline for the rest of the trip, using gasoline at a rate of 0.02 gallons per mile. On the whole trip he averaged 55 miles per gallon. How long was the trip in miles?

- (A) 140
(B) 240
(C) 440
(D) 640
(E) 840

AMC 10A, 2011, Problem 16

Which of the following is equal to $\sqrt{9 - 6\sqrt{2}} + \sqrt{9 + 6\sqrt{2}}$?

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

AMC 10B, 2011, Problem 1

What is

$$\frac{2 + 4 + 6}{1 + 3 + 5} - \frac{1 + 3 + 5}{2 + 4 + 6}?$$

- (A) -1

- (B) $\frac{5}{36}$
 (C) $\frac{7}{12}$
 (D) $\frac{147}{60}$
 (E) $\frac{43}{3}$

AMC 10B, 2011, Problem 2

Josanna's test scores to date are 90, 80, 70, 60, and 85. Her goal is to raise her test average at least 3 points with her next test. What is the minimum test score she would need to accomplish this goal?

- (A) 80
 (B) 82
 (C) 85
 (D) 90
 (E) 95

AMC 10B, 2011, Problem 4

LeRoy and Bernardo went on a week-long trip together and agreed to share the costs equally. Over the week, each of them paid for various joint expenses such as gasoline and car rental. At the end of the trip it turned out that LeRoy had paid A dollars and Bernardo had paid B dollars, where $A < B$. How many dollars must LeRoy give to Bernardo so that they share the costs equally?

- (A) $\frac{A+B}{2}$
 (B) $\frac{A-B}{2}$
 (C) $\frac{B-A}{2}$
 (D) $B - A$
 (E) $A + B$

AMC 10B, 2011, Problem 5

In multiplying two positive integers a and b , Ron reversed the digits of the two-digit number a . His erroneous product was 161. What is the correct value of the product of a and b ?

- (A) 116
 (B) 161
 (C) 204
 (D) 214
 (E) 224

AMC 10B, 2011, Problem 6

On Halloween Casper ate $\frac{1}{2}$ of his candies and then gave 2 candies to his brother. The next day he ate $\frac{1}{2}$ of his remaining candies and then gave

4 candies to his sister. On the third day he ate his final 8 candies. How many candies did Casper have at the beginning?

- (A) 30
 (B) 39
 (C) 48
 (D) 57
 (E) 66

AMC 10B, 2011, Problem 12

Keiko walks once around a track at exactly the same constant speed every day. The sides of the track are straight, and the ends are semicircles. The track has a width of 6 meters, and it takes her 36 seconds longer to walk around the outside edge

of the track than around the inside edge. What is Keiko's speed in meters per second?

- (A) $\frac{\pi}{3}$
- (B) $\frac{2\pi}{3}$
- (C) π
- (D) $\frac{4\pi}{3}$
- (E) $\frac{5\pi}{3}$

AMC 10B, 2011, Problem 14

A rectangular parking lot has a diagonal of 25 meters and an area of 168 square meters. In meters, what is the perimeter of the parking lot?

- (A) 52
- (B) 58
- (C) 62
- (D) 68
- (E) 70

AMC 10A, 2011, Problem 19

What is the product of all the roots of the equation

$$\sqrt{5|x| + 8} = \sqrt{x^2 - 16}.$$

- (A) -64
- (B) -24
- (C) -9
- (D) 24
- (E) 576

AMC 10A, 2010, Problem 1

Mary's top book shelf holds five books with the following widths, in centimeters: 6, $\frac{1}{2}$, 1, 2.5, and 10. What is the average book width, in centimeters?

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

AMC 10A, 2010, Problem 3

Tyrone had 97 marbles and Eric had 11 marbles. Tyrone then gave some of his marbles to Eric so that Tyrone ended with twice as many marbles as Eric. How many marbles did Tyrone give to Eric?

- (A) 3
- (B) 13
- (C) 18
- (D) 25
- (E) 29

AMC 10A, 2010, Problem 4

A book that is to be recorded onto compact discs takes 412 minutes to read aloud. Each disc can hold up to 56 minutes of reading. Assume that the smallest possible number of discs is used and that each disc contains the same length of reading.



How many minutes of reading will each disc contain?

- (A) 50.2
- (B) 51.5
- (C) 52.4
- (D) 53.8
- (E) 55.2

AMC 10A, 2010, Problem 8

Tony works 2 hours a day and is paid \$0.50 per hour for each full year of his age. During a six month period Tony worked 50 days and earned \$

630. How old was Tony at the end of the six month period?

- (A) 9
- (B) 11
- (C) 12
- (D) 13
- (E) 14

AMC 10A, 2010, Problem 9

A palindrome, such as 83438, is a number that remains the same when its digits are reversed. The numbers x and $x + 32$ are three-digit and four-digit palindromes, respectively. What is the sum of the digits of x ?

- (A) 20
- (B) 21
- (C) 22
- (D) 23
- (E) 24

AMC 10A, 2010, Problem 10

Marvin had a birthday on Tuesday, May 27 in the leap year 2008. In what year will his birthday next fall on a Saturday?

- (A) 2011
- (B) 2012
- (C) 2013
- (D) 2015
- (E) 2017

AMC 10A, 2010, Problem 11

The length of the interval of solutions of the inequality $a \leq 2x + 3 \leq b$ is 10. What is $b - a$?

- (A) 6
- (B) 10
- (C) 15
- (D) 20
- (E) 30

AMC 10A, 2010, Problem 12

Logan is constructing a scaled model of his town. The city's water tower stands 40 meters high, and the top portion is a sphere that holds 100,000 liters of water. Logan's miniature water tower holds 0.1 liters. How tall, in meters, should Logan make his tower?

- (A) 0.04



- (B) $\frac{0.4}{\pi}$
- (C) 0.4
- (D) $\frac{4}{\pi}$
- (E) 4

AMC 10A, 2010, Problem 13

Angelina drove at an average rate of 80kmh and then stopped 20 minutes for gas. After the stop, she drove at an average rate of 100kmh. Altogether she drove 250 km in a total trip time of 3 hours including the stop. Which equation could be used to solve for the time t in hours that she drove before her stop?

- (A) $80t + 100\left(\frac{8}{3} - t\right) = 250$
- (B) $80t = 250$
- (C) $100t = 250$
- (D) $90t = 250$
- (E) $80\left(\frac{8}{3} - t\right) + 100t = 250$

AMC 10A, 2010, Problem 21

The polynomial $x^3 - ax^2 + bx - 2010$ has three positive integer roots. What is the smallest possible value of a ?

- (A) 78
- (B) 88
- (C) 98
- (D) 108
- (E) 118

AMC 10B, 2010, Problem 1

What is $100(100 - 3) - (100 \cdot 100 - 3)$?

- (A) $-20,000$
- (B) $-10,000$
- (C) -297
- (D) -6
- (E) 0

AMC 10B, 2010, Problem 2

Makarla attended two meetings during her 9 -hour work day. The first meeting took 45 minutes and the second meeting took twice as long. What percent of her work day was spent attending meetings?

- (A) 15
- (B) 20
- (C) 25
- (D) 30
- (E) 35

AMC 10B, 2010, Problem 5

A month with 31 days has the same number of Mondays and Wednesdays. How many of the seven days of the week could be the first day of this month?

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

(E) 6

AMC 10B, 2010, Problem 7

Shelby drives her scooter at a speed of 30 miles per hour if it is not raining, and 20 miles per hour if it is raining. She drove in the sun in the morning and in the rain in the evening, for a total of 16 miles in 40 minutes. How many minutes did she drive in the rain?

- (A) 18
- (B) 21
- (C) 24
- (D) 27
- (E) 30

AMC 10B, 2010, Problem 8

A ticket to a school play cost x dollars, where x is a whole number. A group of 9th graders buys tickets costing a total of \$48, and a group of 10th graders buys tickets costing a total of \$64. How many values for x are possible?

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

AMC 10B, 2010, Problem 10

Lucky Larry's teacher asked him to substitute numbers for a , b , c , d , and e in the expression $a - (b - (c - (d + e)))$ and evaluate the result. Larry ignored the parentheses but added and subtracted correctly and obtained the correct result by coincidence. The number Larry substituted for a , b , c , and d were 1, 2, 3, and 4, respectively. What number did Larry substitute for e ?

- (A) -5
- (B) -3
- (C) 0
- (D) 3
- (E) 5

AMC 10B, 2010, Problem 11

A shopper plans to purchase an item that has a listed price greater than \$100 and can use any one of the three coupons. Coupon A gives 15% off the listed price, Coupon B gives \$30 off the listed price, and Coupon C gives 25% off the amount by which the listed price exceeds \$100. Let x and y be the smallest and largest prices, respectively, for which Coupon A saves at least as many dollars as Coupon B or C. What is $y - x$?

- (A) 50
- (B) 60
- (C) 75
- (D) 80
- (E) 100

AMC 10B, 2010, Problem 12

At the beginning of the school year, 50% of all students in Mr. Well's class answered "Yes" to the question "Do you love math", and 50% answered "No." At the end of the school year, 70% answered "Yes" and 30% answered "No." Altogether, $x\%$ of the students gave a different answer at the beginning and end of the school year. What is the difference between the



maximum and the minimum possible values of x ?

- (A) 0
- (B) 20
- (C) 40
- (D) 60
- (E) 80

AMC 10B, 2010, Problem 13

What is the sum of all the solutions of $x = |2x - |60 - 2x||$?

- (A) 32
- (B) 60
- (C) 92
- (D) 120
- (E) 124

AMC 10B, 2010, Problem 14

The average of the numbers $1, 2, 3, \dots, 98, 99$, and x is $100x$. What is x ?

- (A) $\frac{49}{101}$
- (B) $\frac{50}{101}$
- (C) $\frac{1}{2}$
- (D) $\frac{51}{101}$
- (E) $\frac{50}{99}$

AMC 10A, 2010, Problem 15

On a 50 -question multiple choice math contest, students receive 4 points for a correct answer, 0 points for an answer left blank, and -1 point for an incorrect answer. Jesse's total score on the contest was 99 . What is the maximum number of questions that Jesse could have answered correctly?

- (A) 25
- (B) 27
- (C) 29
- (D) 31
- (E) 33

AMC 10A, 2009, Problem 1

One can holds 12 ounces of soda, what is the minimum number of cans needed to provide a gallon (128 ounces) of soda?

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

AMC 10A, 2009, Problem 4

Four coins are picked out of a piggy bank that contains a collection of pennies, nickels, dimes, and quarters. Which of the following could not be the total value of the four coins, in cents?

- (A) 15
- (B) 25



- (C) 35
- (D) 45
- (E) 55

AMC 10A, 2009, Problem 3

Which of the following is equal to $1 + \frac{1}{1 + \frac{1}{1+1}}$?

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

AMC 10A, 2009, Problem 4

Eric plans to compete in a triathlon. He can average 2 miles per hour in the $\frac{1}{4}$ mile swim and 6 miles per hour in the 3 -mile run. His goal is to finish the triathlon in 2 hours. To accomplish his goal what must his average speed in miles per hour, be for the 15 -mile bicycle ride?

- (A) $\frac{120}{11}$
- (B) 11
- (C) $\frac{56}{5}$
- (D) $\frac{45}{4}$
- (E) 12

AMC 10A, 2009, Problem 5

What is the sum of the digits of the square of 11111111 ?

- (A) 18
- (B) 27
- (C) 45
- (D) 63
- (E) 81

AMC 10A, 2009, Problem 7

A carton contains milk that is 2% fat, an amount that is 40% less fat than the amount contained in a carton of whole milk. What is the percentage of fat in whole milk?

- (A) $\frac{12}{5}$
- (B) 3
- (C) $\frac{10}{3}$
- (D) 38
- (E) 42

AMC 10A, 2009, Problem 8

Three Generations of the Wen family are going to the movies, two from each generation. The two members of the youngest generation receive a 50% discount as children. The two members of the oldest generation receive a 25% discount as senior citizens. The two members of the middle generation receive no discount. Grandfather Wen, whose senior ticket costs \$6.00, is paying for everyone. How many dollars must he pay?

- (A) 34
- (B) 36
- (C) 42

(D) 46

(E) 48

AMC 10A, 2009, Problem 9

Positive integers a , b , and 2009, with $a < b < 2009$, form a geometric sequence with an integer ratio. What is a .

(A) 7

(B) 41

(C) 49

(D) 289

(E) 2009

AMC 10A, 2009, Problem 16

Let a , b , c , and d be real numbers with $|a - b| = 2$, $|b - c| = 3$, and $|c - d| = 4$. What is the sum of all possible values of $|a - d|$?

(A) 9

(B) 12

(C) 15

(D) 18

(E) 24

AMC 10A, 2009, Problem 18

At Jefferson Summer Camp, 60% of the children play soccer, 30% of the children swim, and 40% of the soccer players swim. To the nearest whole percent, what percent of the non-swimmers play soccer?

(A) 30%

(B) 40%

(C) 49%

(D) 51%

(E) 70%

AMC 10B, 2009, Problem 1

Each morning of her five-day workweek, Jane bought either a 50 -cent muffin or a 75 -cent bagel. Her total cost for the week was a whole number of dollars. How many bagels did she buy?

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

AMC 10B, 2009, Problem 3

Paula the painter had just enough paint for 30 identically sized rooms. Unfortunately, on the way to work, three cans of paint fell off her truck, so she had only enough paint for 25 rooms. How many cans of paint did she use for the 25 rooms?

(A) 10

(B) 12

(C) 15

(D) 18

(E) 25



AMC 10B, 2009, Problem 5

Twenty percent less than 60 is one-third more than what number?

- (A) 16
- (B) 30
- (C) 32
- (D) 36
- (E) 48

AMC 10B, 2009, Problem 6

Kiana has two older twin brothers. The product of their three ages is 128 . What is the sum of their three ages?

- (A) 10
- (B) 12
- (C) 16
- (D) 18
- (E) 24

AMC 10A, 2009, Problem 8

In a certain year the price of gasoline rose by 20% during January, fell by 20% during February, rose by 25% during March, and fell by $x\%$ during April. The price of gasoline at the end of April was the same as it had been at the beginning of January. To the nearest integer, what is x

- (A) 12
- (B) 17
- (C) 20
- (D) 25
- (E) 35

AMC 10B, 2009, Problem 15

When a bucket is two-thirds full of water, the bucket and water weigh a kilograms. When the bucket is one-half full of water the total weight is b kilograms. In terms of a and b , what is the total weight in kilograms when the bucket is full of water?

- (A) $\frac{2}{3}a + \frac{1}{3}b$
- (B) $\frac{3}{2}a - \frac{1}{2}b$
- (C) $\frac{3}{2}a + b$
- (D) $\frac{3}{2}a + 2b$
- (E) $3a - 2b$

AMC 10B, 2009, Problem 19

A particular 12 -hour digital clock displays the hour and minute of a day. Unfortunately, whenever it is supposed to display a 1, it mistakenly displays a 9. For example, when it is 1:16 PM the clock incorrectly shows 9:96 PM. What fraction of the day will the clock show the correct time?

- (A) $\frac{1}{2}$
- (B) $\frac{5}{8}$
- (C) $\frac{3}{4}$
- (D) $\frac{5}{6}$
- (E) $\frac{9}{10}$

AMC 10A, 2008, Problem 1



A bakery owner turns on his doughnut machine at 8:30 AM. At 11:10 AM the machine has completed its job. At what time will the doughnut machine complete the job?

- (A) 1 : 50PM
- (B) 3:00 PM
- (C) 3 : 30PM
- (D) 4:30 PM
- (E) 5:50 PM

AMC 10A, 2008, Problem 2

A square is drawn inside a rectangle. The ratio of the width of the rectangle to a side of the square is 2 : 1. The ratio of the rectangle's length to its width is 2 : 1. What percent of the rectangle's area is inside the square?

- (A) 12.5
- (B) 25
- (C) 50
- (D) 75
- (E) 87.5

AMC 10A, 2008, Problem 3

For the positive integer n , let $\langle n \rangle$ denote the sum of all the positive divisors of n with the exception of n itself. For example, $\langle 4 \rangle = 1 + 2 = 3$ and $\langle 12 \rangle = 1 + 2 + 3 + 4 + 6 = 16$. What is $\langle \langle \langle 6 \rangle \rangle \rangle$?

- (A) 6
- (B) 12
- (C) 24
- (D) 32
- (E) 36

AMC 10A, 2008, Problem 4

Suppose that $\frac{2}{3}$ of 10 bananas are worth as much as 8 oranges. How many oranges are worth as much as $\frac{1}{2}$ of 5 bananas?

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

AMC 10A, 2008, Problem 4

Which of the following is equal to the product

$$\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \frac{6}{7} \times \frac{7}{8} \times \frac{8}{9} \times \frac{9}{10} \times \frac{10}{11} \times \frac{11}{12} \times \frac{12}{13} \times \frac{13}{14} \times \frac{14}{15} \times \frac{15}{16} \times \frac{16}{17} \times \frac{17}{18} \times \frac{18}{19} \times \frac{19}{20}$$

- (A) 251
- (B) 502
- (C) 1004
- (D) 2008
- (E) 4016

AMC 10A, 2008, Problem 6

A triathlete competes in a triathlon in which the swimming, biking, and running segments are all of the same length. The



triathlete swims at a rate of 3 kilometers per hour, bikes at a rate of 20 kilometers per hour, and runs at a rate of 10 kilometers per hour. Which of the following is closest to the triathlete's average speed, in kilometers per hour, for the entire race?

- (A) 3
- (B) 4
- (C) 5
- (D) 6
- (E) 7

AMC 10A, 2008, Problem 7

The fraction

$$\frac{(3^{2008})^2 - (3^{2006})^2}{(3^{2007})^2 - (3^{2005})^2}$$

simplifies to which of the following?

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

AMC 10A, 2008, Problem 8

Heather compares the price of a new computer at two different stores. Store A offers 15% off the sticker price followed by a \$90 rebate, and store B offers 25% off the same sticker price with no rebate. Heather saves \$15 by buying the computer at store A instead of store B . What is the sticker price of the computer, in dollars?

- (A) 750
- (B) 900
- (C) 1000
- (D) 1050
- (E) 1500

AMC 10A, 2008, Problem 9

Suppose that

$$\frac{2x}{3} - \frac{x}{6}$$

is an integer. Which of the following statements must be true about x ?

- (A) It is negative.
- (B) It is even, but not necessarily a multiple of 3.
- (C) It is a multiple of 3, but not necessarily even.
- (D) It is a multiple of 6, but not necessarily a multiple of 12.
- (E) It is a multiple of 12.

AMC 10A, 2008, Problem 12

In a collection of red, blue, and green marbles, there are 25% more red marbles than blue marbles, and there are 60% more green marbles than blue marbles. Suppose that there are r red marbles. What is the total number of marbles in the collection?

- (A) $2.85r$
- (B) $3r$



- (C) $3.4r$
- (D) $3.85r$
- (E) $4.25r$

AMC 10A, 2008, Problem 13

Doug can paint a room in 5 hours. Dave can paint the same room in 7 hours. Doug and Dave paint the room together, take a one-hour break for lunch. Let t be the total time, in hours, required for them to complete the job working together including lunch. Which of the following equations is satisfied by t ?

- (A) $\left(\frac{1}{5} + \frac{1}{7}\right)(t + 1) = 1$
- (B) $\left(\frac{1}{5} + \frac{1}{7}\right)t + 1 = 1$
- (C) $\left(\frac{1}{5} + \frac{1}{7}\right)t = 1$
- (D) $\left(\frac{1}{5} + \frac{1}{7}\right)(t - 1) = 1$
- (E) $(5 + 7)t = 1$

AMC 10A, 2008, Problem 15

Yesterday Han drove 1 hour longer than Ian at an average speed 5 miles per hour faster than Ian. Jan drove 2 hours longer than Ian at an average speed 10 miles per hour faster than Ian. Han drove 70 miles more than Ian. How many more miles did Jan drive than Ian?

- (A) 120
- (B) 130
- (C) 140
- (D) 150
- (E) 160

AMC 10B, 2008, Problem 3

Assume that x is a positive real number. Which is equivalent to $\sqrt[3]{x\sqrt{x}}$?

- (A) $x^{1/6}$
- (B) $x^{1/4}$
- (C) $x^{3/8}$
- (D) $x^{1/2}$
- (E) x

AMC 10B, 2008, Problem 5

For real numbers a and b , define $a * b = (a - b)^2$. What is $(x - y)^2 * (y - x)^2$?

- (A) 0
- (B) $x^2 + y^2$
- (C) $2x^2$
- (D) $2y^2$
- (E) $4xy$

AMC 10B, 2008, Problem 9

A quadratic equation $ax^2 - 2ax + b = 0$ has two real solutions. What is the average of these two solutions?

- (A) 1
- (B) 2
- (C) $\frac{b}{a}$
- (D) $\frac{2b}{a}$
- (E) $\sqrt{2b - a}$

AMC 10B, 2008, Problem 18

Bricklayer Brenda would take nine hours to build a chimney alone, and bricklayer Brandon would take 16 hours alone. When they work together, they talk a lot, and their combined output decreases by 10 bricks per hour. Together, they build the chimney in 5 hours. How many bricks are in the chimney?

- (A) 500
- (B) 900
- (C) 950
- (D) 1000
- (E) 1900

AMC 10A, 2007, Problem 1

One ticket to a show costs \$20 at full price. Susan buys 4 tickets using a coupon that gives her a 25% discount. Pam buys 5 tickets using coupon that gives her a 30% discount. How many more dollars does Pam pay than Susan?

- (A) 2
- (B) 5
- (C) 10
- (D) 15
- (E) 20

AMC 10A, 2007, Problem 4

The larger of two consecutive odd integers is three times the smaller. What is their sum?

- (A) 4
- (B) 8
- (C) 12
- (D) 16
- (E) 20

AMC 10A, 2009, Problem 5

The school store sells 7 pencils and 8 notebooks for \$4.15. It also sells 5 pencils and 3 notebooks for \$1.77. How much do 16 pencils and 10 notebooks cost?

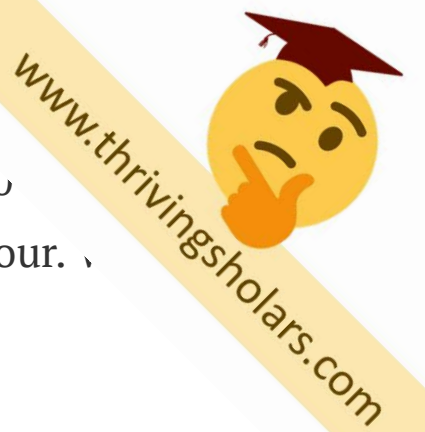
- (A) \$1.76
- (B) \$5.84
- (C) \$6.00
- (D) \$6.16
- (E) \$6.32

AMC 10A, 2008, Problem 7

Last year Mr. Jon Q. Public received an inheritance. He paid 20% in federal taxes on the inheritance, and paid 10% of what he had left in state taxes. He paid a total of \$10500 for both taxes. How many dollars was his inheritance?

- (A) 30000
- (B) 32500
- (C) 35000
- (D) 37500
- (E) 40000

AMC 10A, 2007, Problem 9



Real numbers a and b satisfy the equations $3^a = 81^{b+2}$ and $125^b = 5^{a-3}$. What is ab ?

- (A) -60
- (B) -17
- (C) 9
- (D) 12
- (E) 60

AMC 10A, 2007, Problem 10

The Dunbar family consists of a mother, a father, and some children. The average age of the members of the family is 20, the father is 48 years old, and the average age of the mother and children is 16. How many children are in the family?

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

AMC 10A, 2007, Problem 13

Yan is somewhere between his home and the stadium. To get to the stadium he can walk directly to the stadium, or else he can walk home and then ride his bicycle to the stadium. He rides 7 times as fast as he walks, and both choices require the same amount of time. What is the ratio of Yan's distance from his home to his distance from the stadium?

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

AMC 10A, 2007, Problem 20

Suppose that the number a satisfies the equation $4 = a + a^{-1}$. What is the value of $a^4 + a^{-4}$?

- (A) 164
- (B) 172
- (C) 192
- (D) 194
- (E) 212

AMC 10B, 2007, Problem 2

Define the operation $\star$ by $a \star b = (a + b)b$. What is $(3 \star 5) - (5 \star 3)$?

- (A) -16
- (B) -8
- (C) 0
- (D) 8
- (E) 16

AMC 10B, 2007, Problem 6

The 2007 AMC 10 will be scored by awarding 6 points for each correct response, 0 points for each incorrect response, and 1.5 points for each problem left unanswered. After looking over the 25 problems, Sarah has decided to attempt the first 22 and leave only the last 3 unanswered. How many of the first 22 problems must she solve correctly in order to score at least 100 points?



- (A) 13
(B) 14
(C) 15
(D) 16
(E) 17

AMC 10B, 2007, Problem 12

Tom's age is T years, which is also the sum of the ages of his three children. His age N years ago was twice the sum of their ages then. What is T/N ?

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

AMC 10B, 2007, Problem 14

Some boys and girls are having a car wash to raise money for a class trip to China. Initially 40% of the group are girls. Shortly thereafter two girls leave and two boys arrive, and then 30% of the group are girls. How many girls were initially in the group?

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

AMC 10B, 2007, Problem 16

A teacher gave a test to a class in which 10% of the students are juniors and 90% are seniors. The average score on the test was 84. The juniors all received the same score, and the average score of the seniors was 83. What score did each of the juniors receive on the test?

- (A) 85
(B) 88
(C) 93
(D) 94
(E) 98



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