2016 AMC 8

Time limit: 40 minutes

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https://live.poshenloh.com/past-contests/amc8/2016

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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

2. In rectangle $ABCD$, $AB = 6$ and $AD = 8$. Point M is the midpoint of $\overline{AD}$. What is the area of $\triangle AMC$?

A 12

B 15

C 18

D 20

E 24

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

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

5. The number N is a two-digit number with the following properties:

When N is divided by 9, the remainder is 1.
When N is divided by 10, the remainder is 3.

What is the remainder when N is divided by 11?

A 0

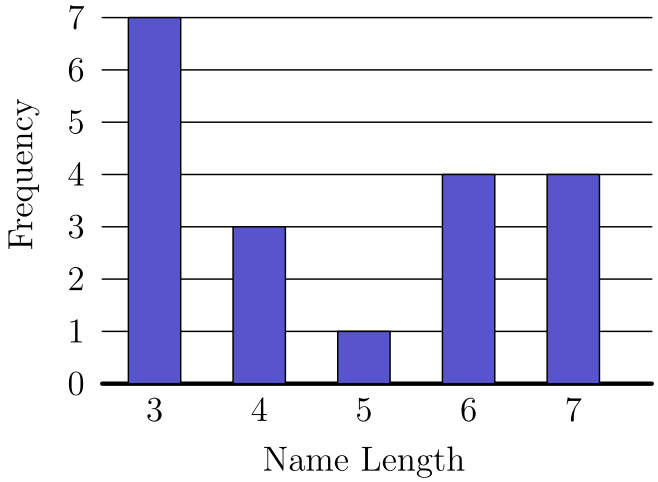
B 2

C 4

D 5

E 7

6. The following bar graph represents the length (in letters) of the names of 19 people. What is the median length of these names?



A 3

B 4

C 5

D 6

E 7

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}

8. Find the value of the expression

$$100 - 98 + 96 - 94 + 92 - 90 + \cdots + 8 - 6 + 4 - 2.$$

A 20

B 40

C 50

D 80

E 100

9. What is the sum of the distinct prime integer divisors of 2016?

A 9

B 12

C 16

D 49

E 63

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

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

12. Jefferson Middle School has the same number of boys and girls. Three-fourths of the girls and two-thirds 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 $\frac{14}{15}$

13. Two different numbers are randomly selected from the set

$$\{-2, -1, 0, 3, 4, 5\}$$

and multiplied together. What is the probability that the product is 0?

A $\frac{1}{6}$

B $\frac{1}{5}$

C $\frac{1}{4}$

D $\frac{1}{3}$

E $\frac{1}{2}$

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 of gas, drove 350 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 Karl drive that day?

A 525

B 560

C 595

D 665

E 735

15. What is the largest power of 2 that is a divisor of $13^4 - 11^4$?

A 8

B 16

C 32

D 64

E 128

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

17. An ATM password at Fred's Bank is composed of four digits from 0 to 9, with repeated digits allowable. If no password may begin with the sequence $9, 1, 1$, then how many passwords are possible?

A 30

B 7290

C 9000

D 9990

E 9999

18. In an All-Area track meet, 216 sprinters enter a 100-meter dash competition. The track has 6 lanes, so only 6 sprinters can compete at a time. At the end of each race, the five non-winners are eliminated, and the winner will compete again in a later race.

How many races are needed to determine the champion sprinter?

A 36

B 42

C 43

D 60

E 72

19. The sum of 25 consecutive even integers is $10{,}000$. What is the largest of these 25 consecutive even integers?

A 360

B 388

C 412

D 416

E 424

20. The least common multiple of a and b is 12, and the least common multiple of b and c is 15. What is the least possible value of the least common multiple of a and c?

A 20

B 30

C 60

D 120

E 180

21. A box contains 3 red chips and 2 green chips. Chips are drawn randomly, one at a time without replacement, until all 3 of the reds are drawn or until both green chips are drawn. What is the probability that the 3 reds are drawn?

A $\frac{3}{10}$

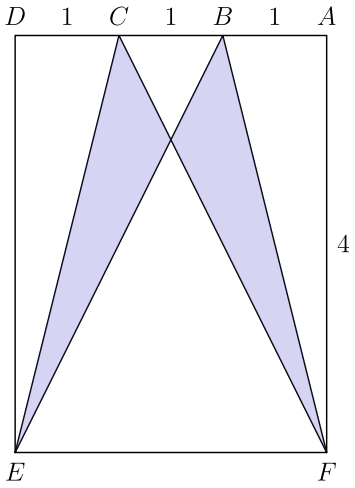
B $\frac{2}{5}$

C $\frac{1}{2}$

D $\frac{3}{5}$

E $\frac{2}{3}$

22. Rectangle $DEFA$ below is a 3×4 rectangle with $DC = CB = BA = 1$. The area of the "bat wings" (shaded area) is



A 2

B $2\frac{1}{2}$

C 3

D $3\frac{1}{2}$

E 4

23. Two congruent circles centered at points A and B each pass through the other circle's center. The line containing both A and B is extended to intersect the circles at points C and D.

The circles intersect at two points, one of which is E. What is the degree measure of $\angle CED$?

A 90

B 105

C 120

D 135

E 150

24. The digits $1, 2, 3, 4$, and 5 are each used once to write a five-digit number $PQRST$. The three-digit number PQR is divisible by 4, the three-digit number QRS is divisible by 5, and the three-digit number RST is divisible by 3. What is P?

A 1

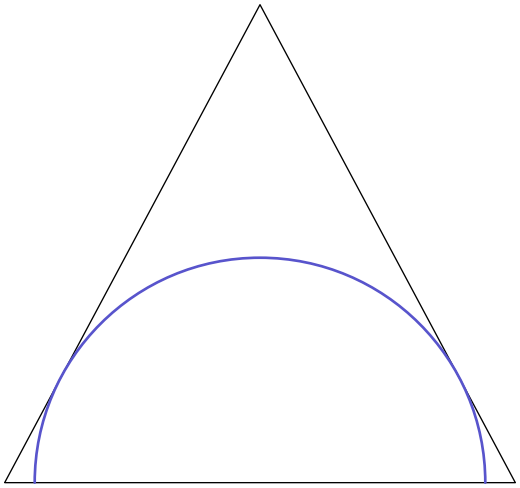
B 2

C 3

D 4

E 5

25. A semicircle is inscribed in an isosceles triangle with base 16 and height 15 so that the diameter of the semicircle is contained in the base of the triangle as shown. What is the radius of the semicircle?



A $4\sqrt{3}$

B $\frac{120}{17}$

C 10

D $\frac{17\sqrt{2}}{2}$

E $\frac{17\sqrt{3}}{2}$

Solutions: https://live.poshenloh.com/past-contests/amc8/2016/solutions