2022 Mini-Mathletes Competition

Name:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

School:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Grade: 4   5

Rules:

1. You will have 60 minutes to complete the exam.

2. The exam consists of 30 problems each with five choices.

3. Each correct answer is worth 6 points and **there is NO penalty for guessing** so you should answer every problem!

4. No calculators, phones, smartwatches, or any other aids are allowed during the test.

5. If you finish before time is called, review your answers. When time is called, stop and put your pencil down. You may not answer any more questions after this point.

6. If you need a pencil or scratch paper during the test, raise your hand.

7. Figures are not necessarily drawn to scale.

Problems:

1. Billy has a stuffed animal collection. Before his birthday, he had 34 stuffed animals. For his birthday, he received 19 more. Now, how many does he have in all?

   (A) 50   **(B)** 51   **(C)** 52   **(D)** 53   **(E)** 54

2. Alice has a $10 bill. How much change will she receive if she buys a notebook for $3.50, a multi-colored pen for $2.75, and a pack of stickers for $1.50?

   (A) $2.00   **(B)** $2.25   **(C)** $2.50   **(D)** $3.25   **(E)** $4.00

3. Charlie's recipe for a dozen cupcakes calls for 2 cups of sugar. How many cups of sugar are needed to make 60 cupcakes?

   (A) 10   **(B)** 12   **(C)** 14   **(D)** 15   **(E)** 16

4. What is the value of the expression $((5 + 6) \times 7) - (5 + 6 \times 7)$?

   (A) 30   **(B)** 33   **(C)** 35   **(D)** 40   **(E)** 45

5. In triangle ABC, shown here, side $AC = 13$ centimeters and side $BC = 8$ centimeters. If ABC has a perimeter of 36 centimeters, what is the length of side AB in centimeters?
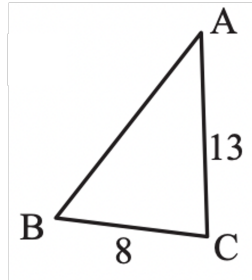

(A) 11   **(B)** 14   **(C)** 15   **(D)** 18   **(E)** 19

6. Express the sum $\frac{3}{4} + \frac{1}{8} + 0.8$ as a simplified improper fraction.

(A) $\frac{3}{2}$ **(B)** $\frac{13}{8}$ **(C)** $\frac{67}{40}$ **(D)** $\frac{15}{8}$ **(E)** $\frac{9}{4}$

7. 24 boy scouts are going on a camping trip with 4 scout leaders. The camping trip lasts three days, and each person will need four bottles of water a day. What is the total number of water bottles needed for the duration of the camping trip?

(A) 96   **(B)** 120   **(C)** 216   **(D)** 296   **(E)** 336

8. Asmi is performing a science experiment. She begins with a tank that is partially filled with water of dimensions 8 feet (length) by 4 feet (width) by 3 feet (height). After pouring in more water, the water level reaches 5 feet in height. How much water was added, in cubic feet, to the tank?

(A) 24   **(B)** 40   **(C)** 56   **(D)** 64   **(E)** 70

9. Let L represent the least common multiple of 12 and 21, and let G represent the greatest common factor of the same numbers. What is $L - G$?

(A) 70   (B) 72   (C) 75   (D) 78   (E) 81

10. If $x \otimes y = x^3 + y^2$ for positive integers x and y. For example, $1 \otimes 2 = 5$. Using this algorithm, what is the value of $(3 \otimes (2 \otimes 5))$?

(A) 60   (B) 891   (C) 957   (D) 1116   (E) 1225

11. In the first three games of a basketball tournament, Eve scored 27, 19, and 20 points, respectively. How many points must she score in the fourth and final game to have scored an average of 26 points per game in the tournament?

(A) 28   (B) 35   (C) 38   (D) 66   (E) 104

12. The bar graph shows the grades in a mathematics class for the last grading period. If A, B, and C are satisfactory grades, what fraction of the grades shown in the graph are satisfactory?
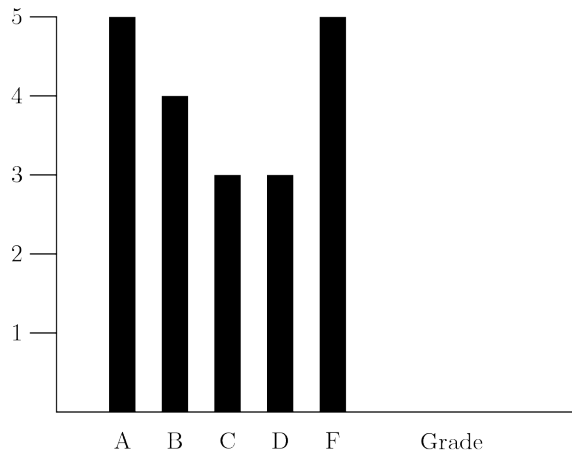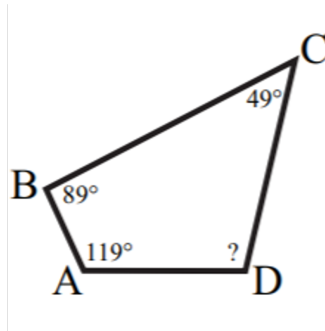

(A) $\frac{2}{5}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{3}{5}$ (E) $\frac{3}{4}$

13. A jar contains 7 red, 8 green, 5 yellow and some blue marbles. If the ratio of red, green, and yellow marbles to blue marbles is 4 : 5, how many total marbles are in the jar?

    (A) 25   **(B)** 28   **(C)** 36   **(D)** 45   **(E)** 50

14. In quadrilateral $ABCD$, $\angle A = 119°$, $\angle B = 89°$, and $\angle C = 49°$. What is $\angle D$?


    (A) $103°$ **(B)** $101°$ **(C)** $99°$ **(D)** $95°$ **(E)** $91°$

15. Anna is three times as old as her friend Kate. Kate is 26 years younger than Mike. Anna and Mike are the same age. What is the sum of Anna's, Kate's, and Mike's ages?

   **(A)** 117   **(B)** 91   **(C)** 81   **(D)** 78   **(E)** 52

16. Below is the floor plan for the living room of Angelica's dollhouse. If Angelica wants to paint the entire living room floor white, how much area will she have to cover, in square centimeters?
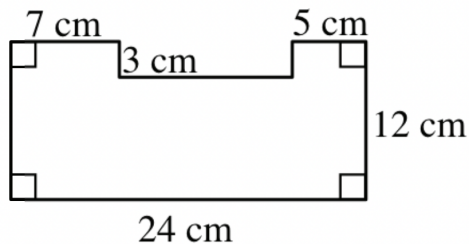
    (A) 225   **(B)** 252   **(C)** 266   **(D)** 270   **(E)** 288

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17. Emma is taking a math test with 40 questions. She answers the first 15 questions correctly, which are worth one point each. Out of the remaining questions, which are worth three points each, she gets 3 incorrect (earning her zero points). What is Emma's final grade on the test, expressed as a percent?

(A) 92%   (B) 90%   (C) 87%   (D) 85%   (E) 81%

18. The figure below shows the first four stages of a dot pattern. How many dots will there be in Stage 7 if the pattern continues?

Stage 1   Stage 2   Stage 3   Stage 4
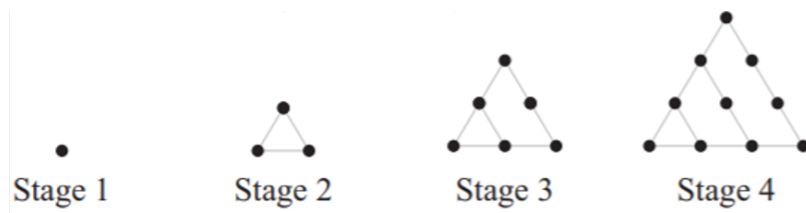
(A) 24   (B) 25   (C) 26   (D) 27   (E) 28

19. Julia, Jim, Jeremy, Jaden, and Joy went out to celebrate Jane's birthday, and they had decided to all split the bill equally. The total cost for the 6 friends was $195.00. However, at the last minute, Jane's friends wanted to pay her share, and thus split the bill equally among the 5 of them. For Jane's friends, how much did their share increase once they paid for Jane?

(A) $6.10   (B) $6.15   (C) $6.25   (D) $6.50   (E) $6.65

20. Daniel and Perry are waiting at the station to catch a train. Daniel's train is scheduled to leave at 1:55 PM but departs 12 minutes late. Perry's train departs 17 minutes earlier than its scheduled time of 2:35 PM. How many minutes are there between the times Daniel and Perry leave on their respective trains?

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

21. Jack and Jill went up the hill to fetch a pail of water. They went up the hill at a rate of 2 miles per hour, waited for 1 hour at the top, and went down the hill twice as fast as they went up. If the total distance was 22 miles (up the hill for 11 miles and down the hill for 11 miles), how many hours did the entire trip take?

(A) 8.75   (B) 9   (C) 9.25   (D) 9.5   (E) 9.75

22. How many zeros are at the end of the product $25 \times 25 \times 25 \times 25 \times 25 \times 25 \times 25 \times 8 \times 8 \times 8$?

(A) 3   (B) 6   (C) 9   (D) 10   (E) 12

23. A middle school running track is made of a rectangle and two identical semicircles, as shown below. The length and width of the rectangular portion of the track are 300 feet and 200 feet, respectively. If Eli jogs around the track once, what distance does he cover?
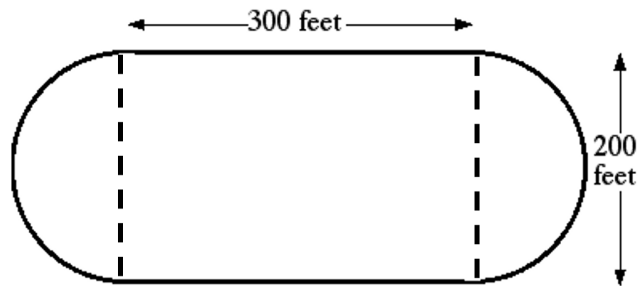
(A) 300   (B) $600 + 100\pi$ (C) $300 + 200\pi$ (D) $600 + 200\pi$ (E) 1000

24. How many integers from 1 to 200 are divisible by 2, 3, or both 2 and 3?

(A) 133   (B) 150   (C) 166   (D) 170   (E) 199

25. Amy's one-quart fruit salad is $\frac{1}{4}$ strawberries and $\frac{3}{4}$ blueberries. Ashlyn's one-quart fruit salad is $\frac{1}{2}$ strawberries and $\frac{1}{2}$ blueberries. When Amy and Ashlyn combine their fruit salads, what portion of the new mixture is blueberries? Express your answer as a common fraction.

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

26. The letters A, B, C, and D represent digits. If the below statements are true, what digit does D represent?

$$
\begin{array}{cc}
 & A \ \ B \\
+ & C \ \ A \\
\hline
 & D \ \ A \\
\end{array}
\qquad
\begin{array}{cc}
 & A \ \ B \\
- & C \ \ A \\
\hline
 & \ \ \ A \\
\end{array}
$$

   (A) 5   (B) 6   (C) 7   (D) 8   (E) 9

27. At the local smoothie shop, people can add either one, two, or three types of fruit in their smoothie. If the possible fruits are banana, strawberry, mango, and peach, what is the total number of unique valid fruit combinations for a smoothie?

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

28. If a and b are positive whole numbers such that $a \times b = 100$, what is the positive difference between the maximum and minimum possible values of $a + b$?

   (A) 100   (B) 81   (C) 32   (D) 20   (E) 2

29. Half of the water is poured out of a full container. Then one-third of the remainder is poured out. Continue the process: one-fourth of the remainder for the third pouring, one-fifth of the remainder for the fourth pouring, etc. After how many pourings does exactly $\frac{1}{10}$ of the original water remain?

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

30. Ten balls numbered 1 to 10 are in a jar. Allie reaches into the jar and randomly removes one of the balls. Then Carl reaches into the jar and randomly removes a different ball. The probability (chance) that the sum of the two numbers on the balls removed is even is:

(A) $\frac{4}{9}$ (B) $\frac{9}{19}$ (C) $\frac{1}{2}$ (D) $\frac{10}{19}$ (E) $\frac{5}{9}$