5 POINTS

1. If Tony's hair, now 3 inches long, grows 0.5 inch every week, Tony's hair will be 8 inches long in _____ weeks.

   A. 25   B. 16   C. 10   D. 6   E. 3.5

2. Of the following fractions, which is smallest?

   A. $\frac{1}{9}$ B. $\frac{2}{19}$ C. $\frac{2}{21}$ D. $\frac{1}{11}$ E. $\frac{2}{23}$

3. A couch weighs one-third as much as a couch potato. If their combined total weight is 720 pounds, how much does the couch potato weigh?

   A. 180 pounds   B. 200 pounds   C. 240 pounds   D. 360 pounds   E. 540 pounds

4. In a certain sequence, every term after the first two terms is the sum of the two terms that precede it. If this sequence begins 0.1, 0.1, 0.2, 0.3, …, what is the 8th term?

   A. 0.8   B. 1.11   C. 1.8   D. 2.1   E. 2.5

5. What is the total number of downward-pointing triangles in the picture? Consider all sizes of triangles.

   A. 21   B. 22   C. 23   D. 24   E. 25
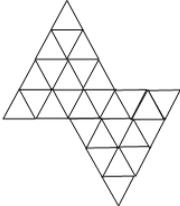
6. A three-dimensional shape is formed by placing a pyramid ABCDP on top of a cube with face ABCD. What is the total number of faces, edges, and vertices of this shape?

   A. 30   B. 32   C. 34   D. 35   E. 44

7. The three lines in the figure intersect at a single point. The angles between pairs of lines are shown. What is the value (in degrees) of x?

   A. 50^0 B. 52^0 C. 58^0 D. 62^0 E. 68^0
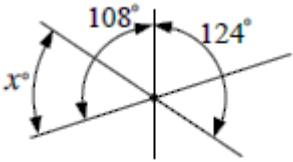
8. If two quadrilaterals share a side, the resulting figure could not be

   A. a triangle   B. a square   C. a trapezoid   D. a pentagon   E. a hexagon

7 POINTS

9. What is the greatest multiple of 37 that has exactly 3 digits?

   A. 888   B. 889   C. 999   D. 963   E. 967

10. The first row has 2 dots, the second row has 4 dots, and so on. More rows are added. Each additional row has 2 more dots than the row before it. How many dots will there be in the first 12 rows combined?

    A. 126   B. 130   C. 132   D. 156   E. 182
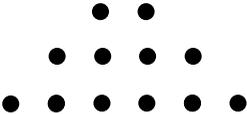
11. In a room with 24 students, 5/6 are boys. If 6 boys leave the room and 7 girls enter the room, what percent of the students now in the room are boys?

    A. 52%   B. 56%   C. 58%   D. 60%   E. 61%

12. A bicycle rider rides at a constant speed. By 10:00 AM, she has completed 3/8 of her ride; by 11:00 AM, she has completed 3/4 of her ride. How many minutes did the whole ride take?

    A. 120   B. 150   C. 160   D. 175   E. 180

13. Six circles fit snugly in a rectangle with length 72 cm. What is the total area of all the shaded regions? ($\pi = 3.14$) Round to the nearest square centimeter.

    A. 743 cm²   B. 1208 cm²   C. 2470 cm²   D. 3004 cm²   E. 7401 cm²
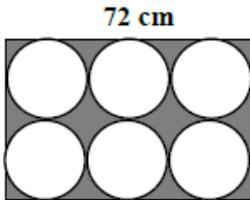
14. For every 3°C rise in temperature, the volume of a certain gas increases by 4 cubic centimeters. 50 cubic centimeters of this gas at –8°C was heated until there were 86 cubic centimeters of gas. What was the temperature of the gas when it reached the volume of 86 cubic centimeters?

    A. 19°C   B. 21.5°C   C. 27°C   D. 35°C   E. 40°C

15. What fraction of the numbers from 1 to 100, inclusive, are primes?

    A. 1/7   B. 1/6   C. 1/5   D. 1/4   E. 2/9

10 POINTS

16. At the start of the day, Victor had $91 and Bella had $28. They each spent the same amount of money. The ratio of Victor's money to Bella's money at the end of the day was 4 to 1. How much money did they spend altogether?

    A. $14   B. $16   C. $17   D. $18   E. $19

17. Three people are coloring the same piece of 8.5 in. by 14 in. paper. Anna starts on the left side and painted half of the paper red. Ben starts on the right side and painted three-fourth of the entire paper green. Caitlin starts in the middle and painted one-third of the entire paper, evenly on either side of the center line, using blue color. What fraction of the paper has all three colors painted on it?

    A. 1/3   B. 1/4   C. 1/5   D. 1/6   E. 1/8

18. The three dimensions in centimeters (length, width and height) of a right rectangular prism are all natural numbers. The volume of the prism is 770 cm³. What is the least possible sum that the three dimensions can have?
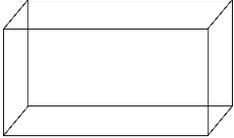
    A. 48   B. 34   C. 30   D. 28   E. 24
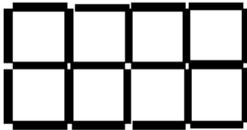
19. Twenty-two rods of equal length are needed to build this 2 by 4 array of 8 small squares. How many rods would be needed to construct a 2 by 40 array of 80 small squares?

    A. 200   B. 202   C. 206   D. 216   E. 220

20. A 3-digit number has the following properties: the hundreds digit is a composite number, the tens digit is a prime number, and the units' digit is greater than 2 but less than or equal to 6. How many such 3-digit numbers are there in total?

    A. 64   B. 61   C. 60   D. 56   E. 54

MATH CHALLENGE TOURNAMENT
MASTERS 2019
April 20, 2019

Problem Solving Challenge
Grade 5
Problem 1 – 20

Do not begin until you are instructed to do so.

Problem Solving Challenge (40 minutes)

You may use scratch paper to do any calculation to reach final answers.
Mark your answers in the ANSWER SHEET.
You have 40 minutes to complete the Problem-Solving Challenge