MATHCOUNTS®

2019
■ School Competition ■
Team Round
Problems 1–10

Team Members _____ , Captain

_____

_____

_____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This section of the competition consists of 10 problems which the team has 20 minutes to complete. Team members may work together in any way to solve the problems. Team members may talk to each other during this section of the competition. This round assumes the use of calculators, and calculations also may be done on scratch paper, but no other aids are allowed. All answers must be complete, legible and simplified to lowest terms. The team captain must record the team's official answers on his/her own competition booklet, which is the only booklet that will be scored. If the team completes the problems before time is called, use the remaining time to check your answers.

Total Correct	Scorer's Initials

0 1 2 3 4 5 6 7 8 9

1. _____ tiles

A classroom is 24 feet wide and 30 feet long. What is the fewest number of 2-foot by 3-foot rectangular tiles needed to completely to cover the floor?

2. _____ cases

Ellen found Misty's favorite cat food at two stores. Purrina charges $20 per case plus a single $15 shipping fee. Meow Meow charges $18 per case plus a single $25 shipping fee. How many cases must Ellen buy if she wants the total cost to be the same at both stores?

3. _____ polygons

Keisha draws several polygons on a sheet of paper. Each of the ten words or phrases shown describes at least one of her polygons. What is the fewest possible number of polygons that Keisha drew?

▪ Rectangle ▪ ▪ Obtuse Triangle ▪ ▪ Hexagon ▪ ▪ Square ▪

▪ 16 Vertices or more ▪ ▪ Vertex with 108° Angle ▪ ▪ 11 Sides or more ▪

▪ Regular Polygon ▪ ▪ Parallelogram ▪ ▪ Isosceles Triangle ▪

4. _____ colorings

Liz wants to color each of the first 21 positive integers red or blue. She wants to do this in such a way that an integer and twice that integer are never the same color. How many distinct colorings of the first 21 positive integers fit this criterion?

5. _____

In the magic square shown, the sums of the numbers in each row, each column and each diagonal are all equal. What is the value of D?

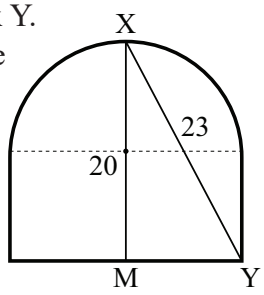
A	48	B
42	C	50
D	44	45

6. _____ cm^3

Sally has ten pet termites, each of which eats 6 cm^3 of wood every 20 minutes. She has a wooden block measuring 10 cm by 10 cm by 15 cm. Sally places one termite on the block, then an hour later places a second termite on the block, then an hour later places a third termite on the block, and so on. She continues placing one additional termite on the wood every hour until all ten termites are on the wooden block. What volume of wood will the termites eat in the first 12 hours after the first termite is placed on the wooden block?

7. _____ in^2

The figure shown is composed of a semicircle and a rectangle. A segment from point X of the arc is drawn perpendicular to the base and intersecting the base at its midpoint M. Another segment is drawn from X to vertex Y. If XM = 20 inches and XY = 23 inches, what is the area of the figure? Express your answer to the nearest whole number.



8. _____ ways

How many different ways are there to remove five letters from the word "CAROLINA" so that the remaining three letters are in alphabetical order?

9. _____

Jo's American truck's fuel economy of x miles per U.S. gallon is equivalent to Adelbert's European car's fuel economy of x liters per 100 km. Given that one U.S. gallon equals 3.785 liters, and one mile equals 1.609 km, what is the numerical value of x? Express your answer as a decimal to the nearest hundredth.

10. _____ candies

Irina ate some candies on Monday. On Tuesday, she ate twice as many candies as she did on Monday. On Wednesday, she ate a third as many candies as she did on Tuesday. On Thursday, she ate five more candies than she did on Wednesday. On Friday, she ate two fewer candies than she did on Thursday. If she ate the same number of candies on Friday as she did on Monday, how many did she eat on Tuesday?