
MATHCOUNTS®

2012

■ Chapter Competition ■
Team Round
Problems 1–10

School _____

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

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1. \$ _____

The first third of the tickets sold for the community play will sell for \$8 each, and the remaining tickets will sell for \$10 each. The auditorium has 27 rows of seats with 44 seats in each row. If tickets are sold for every seat in the auditorium, how many dollars will be collected from ticket sales?



2. (_____ , _____)

The endpoints of a diameter of circle M are $(-1, -4)$ and $(-7, 6)$. What are the coordinates of the center of circle M? Express your answer as an ordered pair.

3. _____

The mean of the list of nine numbers below is 9. If one number from the list is removed and the mean decreases by 1, what is the value of the number that was removed?

1, 2, 4, 8, 9, 10, 14, 16, 17

4. _____

Line l is perpendicular to the line with equation $6y = kx + 24$. The slope of line l is -2 . What is the value of k ?

5. \$ _____

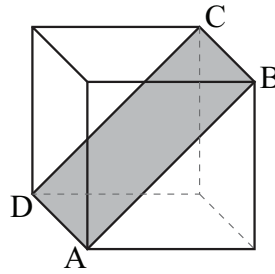


Sam's monthly commission in dollars is $C = 270g + 3g^2$, where g is the number of cars he sells. In January he sold 30 cars. In dollars, how much commission did Sam earn in January?

6. _____ ft^3

A courtyard has a shallow fish pond in the shape of a square. The perimeter of the pond is 24 ft, and the water is 6 in deep. In cubic feet, what is the volume of the water in the pond?

7. _____ units² The cube shown has a side length of s units. Points A, B, C and D are vertices of the cube, as shown. What is the area of rectangle ABCD in terms of s ? Express your answer in simplest radical form.



8. _____ days It rained on exactly 10 days during Tricia's vacation. On each rainy day, it rained either in the morning or in the afternoon, but not both. There were exactly 13 mornings when it did not rain and exactly 17 afternoons when it did not rain. How many days did Tricia's vacation last?

9. _____ If the letters of the word ELEMENT are randomly arranged, what is the probability that the three E's are consecutive? Express your answer as a common fraction.

10. _____ The diagram shows eight congruent squares inside a circle. Every shaded square has one vertex on the circle. What is the ratio of the shaded area to the area of the circle? Express your answer as a decimal to the nearest hundredth.

