MathCounts
2012 Chapter Competition

Team Round

Team Member #1 _________________________________________
Team Member #2 _________________________________________
Team Member #3 _________________________________________
Team Member #4 _________________________________________
1. The first third of tickets for the play sell for $8 each. Remaining tickets sell for $10 each. There are 27 rows of seats with 44 seats in each row. We are asked to find out how much will be collected from selling all the tickets.

2. The endpoints of a diameter of a circle are \((-1, -4)\) and \((-7, 6)\). We must find the coordinates of the center of the circle.

3. The mean of \(\{1, 2, 4, 8, 9, 10, 14, 16, 17\}\) is 9. If one number is removed and the mean decreases by 1, what is the value of the number that was removed?

4. Line \(l\) is perpendicular to the line with equation \(6y = kx + 24\). The slope of line \(l\) is \(-2\). We must find the value of \(k\).
5. Sam’s monthly commission is
   \[ C = 270g + 3g^2, \text{ where } g \text{ is the number of cars that Sam sells.} \] Sam sold 30 cars so how much commission did Sam earn?

6. There is 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. We must find the volume of the water in the pond.

7. The cube shown has a side length of \( s \). Points A, B, C and D are vertices of the cube. We need to find the area of rectangle ABCD.
8. It rained on exactly 10 days during Tricia's vacation. It rained either in the morning or in the afternoon on each rainy day. There were 13 mornings when it didn't rain and 17 afternoons when it didn't rain. So 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?

10. The diagram shows 8 congruent squares inside a circle. Find the ratio of the shaded area to the area of the circle.