2015 Washington State Math Championship

$$B > \frac{1}{n}\sum_{i=1}^{n} x_i$$

(Be greater than average)

Geometry – 5th Grade

1. **2 points:** Mr. Reed Vine wants to create a square, regular octagon, rhombus, and regular pentagon, each with side lengths of 6 centimeters, out of his ridiculously long licorice rope. How long of a licorice rope, in centimeters, will he need in order to have just enough to make all four shapes?

2. **2 points:** Two congruent squares are placed adjacent to each other so that they share a side. If the area of the resulting rectangle is 200, what is the perimeter of the rectangle?

3. **2 points:** The supplement of an angle is equal to 20 degrees more than three times the measure of the angle. What is the degree measure of the angle?

4. **3 points:** How many reflective lines of symmetry can be drawn on a polygon with vertices at the points with coordinates $(2, 3)$, $(2, 9)$, $(4, 9)$, and $(4, 3)$?

5. **3 points:** If the lengths of two of the sides of a triangle are 4 and 7, how many different integer lengths are possible for the third side?

6. **3 points:** George has enough money to buy 30 yards of invisible electrical fencing to put in his front yard. George uses all of the fencing to form a circular region. What is the area in which his curious monkey can play? **Express your answer to the nearest square yard.**

7. **3 points:** What is the area of the polygon whose vertices are at the points with coordinates $(0, 0)$, $(0, 4)$, $(4, 4)$, $(10, 0)$, and $(4, -3)$?

8. **4 points:** What angle do the minute and second hand of a standard analogue clock form at 4:15? **Express your answer as a decimal.**

9. **4 points:** How many unique diagonals does a regular 9-sided polygon have?

10. **4 points:** Suppose that the longer leg of a right triangle is twice the length of the shorter leg. If the length of the hypotenuse is 15, what is the length of the shortest side of the triangle? **Express your answer to the nearest hundredth.**