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

(Be greater than average)

Geometry – 6$^{\text{th}}$ Grade

1. **2 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 $(4,3)$?

2. **2 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?

3. **2 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.**

4. **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 $(4,-3)$?

5. **3 points:** What angle do the minute and second hand of a standard analogue clock form at 4:15? **Express your answer as a decimal.**

6. **3 points:** How many unique diagonals does a regular 9-sided polygon have?

7. **3 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.**

8. **4 points:** Suppose that 64 unit cubes are used to make a larger cube with a side length of 4, and then the unit cube at each of the vertices is removed. What is the surface area of the resulting figure?

9. **4 points:** A roller paint brush is cylindrical shaped and can paint only along the sides (not the top or bottom). The roller brush that you are using has a radius of 3 inches and a length of 12 inches. Assuming that you do not overlap any paint and the brush does not rotate when you lift it up to move it, how many rotations will it take to paint a board that has a length of 36π inches and height of 3 feet?

10. **4 points:** A sphere of radius 3 shares the center of a larger sphere. If the volume of the space between the two spheres is $\frac{171\pi}{2}$, what is the radius of the larger sphere? **Express your answer as a decimal.**