



## Geometry – 8<sup>th</sup> Grade

- 2 points:** How many acute isosceles triangles with unique angle measurements are there such that all three of the interior angles are of integral measure?
- 2 points:** On a standard analog clock, what is the smaller of the two angles that are formed by the minute hand and hour hand at 4:25? **Express your answer as a decimal.**
- 2 points:** In trapezoid  $MATH$ ,  $MA = 4$ ,  $AT = 8$ ,  $m\angle HMA = m\angle MAT = 90^\circ$ , and  $m\angle THM = 45^\circ$ . What is the perimeter of the trapezoid? **Express your answer as a decimal to the nearest tenth.**
- 3 points:** Let  $QWERTY$  be a regular hexagon. Diagonals are drawn from vertex  $Q$  to vertex  $E$  and from vertex  $E$  to vertex  $T$ , forming  $\angle QET$ . What is the smaller of the two possible angle measures of  $\angle QET$ ?
- 3 points:** On each face of a cube that has a volume of 64, the largest possible hemisphere is placed such that the circular base is inscribed in the square face of the cube. What is the surface area of the new shape? **Express your answer to the nearest square unit.**
- 3 points:** A rectangular fish tank, completely full of water, rests on a table and is slowly lifted until the bottom of the tank forms a 45 degree angle with the table. At that point, 13500 cubic inches of water are left in the tank due to some water spilling out. If the tank has a side that is 30 inches in length and 30 inches tall, and if 45% of the water fell out when the tank was tipped, what is the width of the tank, in inches? **Express your answer as a mixed number.**
- 3 points:** What is the area of the region bounded by the lines  $y = x - 5$ ,  $y = 3 - x$ , and  $y = -8$ ?
- 4 points:** If a square circumscribes a regular octagon that has a perimeter of 64, what is the area of the square? **Express your answer to the nearest square unit.**
- 4 points:** A semicircle with an area of 50 has a square inscribed in it. If a circle is then inscribed inside the square, what is the area of that circle? **Express your answer to the nearest square unit.**
- 4 points:** An isosceles triangle, with vertices at the points with coordinates  $A(2, 6)$ ,  $B(8, 2)$ , and  $C(7, 7)$ , is rotated around the line that passes through  $C$  and the midpoint of  $\overline{AB}$ . What is the volume of the resulting figure? **Express your answer to the nearest cubic unit.**