MBMT Geometry Round — Dedekind

May 21, 2022

Full Name _____

Student ID Number _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This round consists of **8** questions. You will have **30** minutes to complete the round. Each question is *not* worth the same number of points. Questions answered correctly by fewer competitors will be weighted more heavily. Please write your answers in a reasonably simplified form.

_____ **1** A Giant Hopper is 200 meters away from you. It can hop 50 meters. How many hops would it take for it to reach you?

_____ **2** A rope of length 6 is used to form the edges of an equilateral triangle (a triangle with equal side lengths). What is the length of one of these edges?

_____ **3** Point E is on side AB of rectangle $ABCD$. Find the area of triangle ECD divided by the area of rectangle $ABCD$.

_____ **4** Garb and Grunt have two rectangular pastures of area 30. Garb notices that his has a side length of 3, while Grunt's has a side length of 5. What's the positive difference between the perimeters of their pastures?

_____ **5** Let points A and B be on a circle with radius 6 and center O. If $\angle AOB = 90^\circ$, find the area of triangle AOB.

_____ **6** A scalene triangle (the 3 side lengths are all different) has integer angle measures (in degrees). What is the largest possible difference between two angles in the triangle?

_____ **7** Square $ABCD$ has side length 6. If triangle ABE has area 9, find the sum of all possible values of the distance from E to line CD.

_____ **8** Let point E be on side $\overline{AB}$ of square $ABCD$ with side length 2. Given $DE = BC + BE$, find BE.