MBMT Geometry Round — Euclid

Full Name _____

Team 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 by fewer competitors are weighted more heavily. Please write your answers in the simplest possible form.

_____ 1. What is the perimeter of a rectangle if its area is 24 and one side length is 6?

_____ 2. John moves 3 miles south, then 2 miles west, then 7 miles north, and then 5 miles east. What is the length of the shortest path, in miles, from John's current position to his original position?

_____ 3. An equilateral triangle ABC is drawn with side length 2. The midpoints of sides AB, BC, and CA are constructed, and are connected to form a triangle. What is the perimeter of the newly formed triangle?

_____ 4. Let triangle ABC have sides $AB = 74$ and $AC = 5$. What is the sum of all possible integral side lengths of BC?

_____ 5. What is the area of quadrilateral $ABCD$ on the coordinate plane with $A(1,0)$, $B(0,1)$, $C(1,3)$, and $D(5,2)$?

_____ 6. Let $ABCD$ be a square with side length 30. A circle centered at the center of $ABCD$ with diameter 34 is drawn. Let E and F be the points at which the circle intersects side AB. What is EF?

_____ 7. What is the area of the quadrilateral bounded by $|2x| + |3y| = 6$?

_____ 8. A circle O with radius 2 has a regular hexagon inscribed in it. Upon the sides of the hexagon, equilateral triangles of side length 2 are erected outwards. Find the area of the union of these triangles and circle O.