MBMT Geometry Round — Fermat

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 worth the same number of points. Please write your answers in the simplest possible form.

_____ 1. A circle has area π. Find the circumference of the circle.

_____ 2. In triangle ABC, $AB = 5$, $BC = 12$, and $\angle B = 90°$. Compute AC.

_____ 3. A square has area 2015. Find the length of the square's diagonal.

_____ 4. I have two cylindrical candles. The first candle has diameter 1 and height 1. The second candle has diameter 2 and height 2. Both candles are lit at 1:00 PM and both burn at the same constant rate (volume per time period). The first candle burns out at 1:50 PM. When does the second candle burn out? Specify AM or PM.

_____ 5. In triangle ABC, BC has length 12, the altitude from A to BC has length 6, and the altitude from C to AB has length 8. Compute the length of AB.

_____ 6. Let ABC be an isosceles triangle with base AC. Suppose that there exists a point D on side AB such that $AC = CD = BD$. Find the degree measure of $\angle ABC$.

_____ 7. In concave quadrilateral $ABCD$, $\angle ABC = 60°$ and $\angle ADC = 240°$. If $AD = CD = 4$, compute BD.

_____ 8. A circle of radius 5 is inscribed in an isosceles trapezoid with legs of length 14. Compute the area of the trapezoid.