

MBMT Geometry Round — Euler

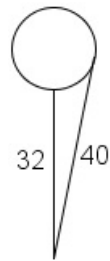
Full Name _____

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 square has area 2015. Find the length of the square's diagonal.
- _____ 2. 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 .
- _____ 3. 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 $\angle ABC$.
- _____ 4. The Egyptian goddess Isil has a staff consisting of a pole with a circle on top. The length of the pole is 32 inches, and the tangent segment from the bottom of the pole to the circle is 40 inches. Find the radius of the circle, in inches.



- _____ 5. The two concentric circles shown below have radii 1 and 2. A chord of the larger circle that is tangent to the smaller circle is drawn. Find the area of the shaded region, bounded by the chord and the larger circle.



- _____ 6. In concave quadrilateral $ABCD$, $\angle ABC = 60^\circ$ and $\angle ADC = 240^\circ$. If $AD = CD = 4$, compute BD .
- _____ 7. A circle of radius 5 is inscribed in an isosceles trapezoid with legs of length 14. Compute the area of the trapezoid.
- _____ 8. In circle O , perpendicular chords AB and CD intersect at E . If $AE = 8$, $BE = 10$, and $CE = 4$, compute the radius of the circle.