MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2015 ANSWERS

Round 1 Trig: Right Triangles, Laws of Sine and Cosine

    A) $(188, 235)$ B) $\sqrt{129}$ C) $(60, 7)$

Round 2 Arithmetic/Elementary Number Theory

    A) 2181 B) 24 C) 25 [50884]

Round 3 Coordinate Geometry of Lines and Circles

    A) 10π B) $(5, 1)$ C) $554, \ 562$

Round 4 Algebra 2: Log and Exponential Functions

    A) $1 : 243$ B) $\left(\dfrac{1}{4}, -\dfrac{2}{3}\right)$ C) $\left(-\dfrac{2}{3}, 3\right)$

Round 5 Algebra 1: Ratio, Proportion or Variation

    A) 6.3 (or $\dfrac{63}{10}$)   B) $(5, -8)$ C) $(16, 64)$

Round 6 Plane Geometry: Polygons (no areas)

    A) 8 B) 216 C) 165

Team Round

    A) $3\left(2 + \sqrt{6}\right)$ D) $\dfrac{mn}{100}$

    B) 431 E) $(8, 7)$

    C) $(-6.6, 11.2)$ or $\left(-\dfrac{33}{5}, \dfrac{56}{5}\right)$ F) 1416