MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2012 ANSWERS

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

A) $\dfrac{12}{37}$

B) $\dfrac{3}{5}$

C) 3

Round 2 Arithmetic/Elementary Number Theory

A) 343

B) 5

C) 350

Round 3 Coordinate Geometry of Lines and Circles

A) $\dfrac{11}{5}$

B) $6\left(\sqrt{2}+1\right)$

C) $\left(1,4,8\right)$

Round 4 Alg 2: Log and Exponential Functions

A) $\dfrac{1}{11}$

B) 2

C) (4, 3, −3)

Round 5 Alg 1: Ratio, Proportion or Variation

A) 25

B) $\left(\dfrac{9}{125},\dfrac{81}{4000}\right)$ or (0.072, 0.02025)

C) 225

Round 6 Plane Geometry: Polygons (no areas)

A) $4+9\sqrt{2}$

B) 348

C) 170

Team Round

A) 840

B) 166

C) $\dfrac{3\sqrt{2}}{4}$

D) (−12, 29)

E) −3

F) 19