

**MASSACHUSETTS MATHEMATICS LEAGUE  
CONTEST 4 - JANUARY 2015 ANSWERS**

**Round 1 Analytic Geometry: Anything**

- A)  $(4, 0, 120, 169)$       B)  $(x + 2)^2 + (y - 1)^2 = 10$       C)  $\left(\frac{\sqrt{6}}{2}, -1, 0\right)$

**Round 2 Alg: Factoring**

- A) 2400      B)  $-1, 3, 5$       C)  $\frac{1}{2}$

**Round 3 Trig: Equations**

- A)  $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$       B)  $-\frac{\pi}{3}, -\frac{2\pi}{3}$       C)  $\frac{7\pi}{60}, \frac{19\pi}{60}$

**Round 4 Alg 2: Quadratic Equations**

- A)  $(-22, 5)$       B)  $m < \frac{2}{3}, m \neq 0$       C)  $42, -6, -7$

All 3 answers are required.

**Round 5 Geometry: Similarity**

- A)  $\frac{\sqrt{2}}{2}$       B) 20      C)  $5 : 9$

**Round 6 Alg 1: Anything**

- A)  $(9, 2)$       B) 5      C) 21

**Team Round**

- A)  $\frac{33}{16}$       D) 144  
B)  $(1, 0), (17, 4)$       E)  $a^2 + ab$  (or equivalent)  
C)  $\frac{\pi}{4} < x < \frac{\pi}{3}, \frac{2\pi}{3} < x < \frac{3\pi}{4},$       F)  $-\frac{3}{2}$   
 $\frac{5\pi}{4} < x < \frac{4\pi}{3}, \frac{5\pi}{3} < x < \frac{7\pi}{4}$   
(All 4 intervals required.)