

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2011 ANSWERS**

Round 1 Analytic Geometry: Anything

- A) 5 B) $3x - 2y - 5 = 0$ C) (4.5, 1), (16.5, 13)
- or equivalent -

Round 2 Alg1: Factoring

- A) 99, -101 B) 48 C) $A - 4$, $-A$

Round 3 Trig: Equations

- A) 117 B) $0, \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}$ C) $\pi, \frac{5\pi}{4}, 2\pi, \frac{9\pi}{4}$
(in any order) (in any order)

Round 4 Alg 2: Quadratic Equations

- A) $\frac{25}{6}$ (or equivalent) B) 41 C) $m \leq -2$ or $m \geq 6$ ($m \neq -3$)
- or equivalent -

Round 5 Geometry: Similarity

- A) 4 : 21 B) 32 : 9 C) $\frac{459\sqrt{3}}{4}$

Round 6 Alg 1: Anything

- A) (-11, 20, -3) B) 2% C) 14

Team Round

- A) $11\sqrt{2}$ D) $y = \frac{x+2}{3}, \frac{1-x}{2}$
(-or equivalent simplified expressions-)
- B) $(x^4 - x^2 + 1)(x^2 - x + 1)(x^2 + x + 1)$ E) $\frac{64}{25}$
- or equivalent -
- C) $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$ F) (8, 548)