

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 2 - NOVEMBER 2011 ANSWERS**

Round 1 Algebra 2: Complex Numbers (No Trig)

A) -12

B) 1

C) $-8 - 3\sqrt{3}i$

Round 2 Algebra 1: Anything

A) 1.5

B) 63

C) 2

Round 3 Plane Geometry: Area of Rectilinear Figures

A) 10.5

B) $16\sqrt{34}$

C) $\frac{8}{5}\sqrt{10}$

Round 4 Algebra 1: Factoring and its Applications

A) 24

B) $6x$

C) $\frac{35}{4}$ ($8\frac{3}{4}$ or 8.75)

Round 5 Trig: Functions of Special Angles

A) $\frac{4}{5}$ (or 0.8)

B) $(17, 12, 4)$

C) 4920 [$1500, 1560, 1860$]

Round 6 Plane Geometry: Angles, Triangles and Parallels

A) 78°

B) $45 - \frac{3k}{2}$ or equivalent

C) 222°

Team Round

A) $\pm 4\sqrt{3}, \pm 2\sqrt{10}$

D) $k = 10, 11, 14, 25$ (in any order)

B) D and E only

E) $2 - \sqrt{3}$

C) $k + \sqrt{k^2 - 1}$

F) $(2, 15)$