MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 – FEBRUARY 2012 ANSWERS

Round 1 Alg 2: Algebraic Functions

A) 21   B) 1 : 18   C) $f(2x) = \dfrac{3f(x)+1}{f(x)+3}$

Round 2 Arithmetic/ Number Theory

A) (R, F)   B) 317   C) (5, 29)

Round 3 Trig Identities and/or Inverse Functions

A) 0.6 (or $\dfrac{3}{5}$)   B) $-\dfrac{187}{205}$ C) (2, 3, 4)

Round 4 Alg 1: Word Problems

A) 80 mph   B) 204   C) $\dfrac{BC}{A-C}$

Round 5 Geometry: Circles

A) 288π B) $4\sqrt{5}$ C) 0.4 (or $\dfrac{2}{5}$)

Round 6 Alg 2: Sequences and Series

A) 2445   B) $\dfrac{17}{81}$ C) $\dfrac{3-15i}{65}$

Team Round

A) 2   D) 40

B) 476   E) 20°

C) $\left(0, \dfrac{1}{2}, 4\right)$ F) $-1 < r \le -\dfrac{1}{2}$ or $\dfrac{1}{3} \le r \le \dfrac{1}{2}$