

**MASSACHUSETTS MATHEMATICS LEAGUE  
CONTEST 4 - JANUARY 2012  
ROUND 3 TRIG: EQUATIONS WITH A REASONABLE NUMBER OF SOLUTIONS**

**ANSWERS**

A) \_\_\_\_\_

B) \_\_\_\_\_

C) \_\_\_\_\_

**\*\*\* All answers should be expressed in degrees over the specified intervals. \*\*\***

A) Solve for  $x$  over  $-90^\circ < x < 0^\circ$ .  $\sin(3x) = -\frac{1}{2}$

B) Solve for  $x$ , where  $0^\circ \leq x < 360^\circ$ .  $3(\cot x + \csc x) = 2 \sin x$

C) Solve for  $x$  over  $0^\circ < x < 180^\circ$ .  $\cos(2x) - (1 - \sin^2 x) < -0.5$