MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2015
ROUND 3 TRIG: EQUATIONS WITH A REASONABLE NUMBER OF SOLUTIONS

ANSWERS

A) _____

B) _____

C) _____

All solutions must be expressed in radians.
Pay attention to the specified range of the solutions in each question.

A) Compute the four solutions for which $x \in [0, 2\pi)$ and $\frac{1}{2} + \sin^2 x = \cos^2 x$.

B) Solve for x over $-\pi < x < 0$: $8\cos^3 x - 4\cos^2 x - 2\cos x + 1 = 0$

C) Compute the two values of x over $0 < x < \frac{\pi}{2}$: $\tan\left(2x - \frac{\pi}{4}\right) = \cot\left(3x + \frac{\pi}{6}\right)$