MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 – JANUARY 2007
ROUND 3 TRIG: EQUATIONS WITH A REASONABLE NUMBER OF SOLUTIONS

ANSWERS

A) _____

B) _____

C) _____

******* NO CALCULATORS ON THIS ROUND ******

A) Solve for x, where $0 \leq x < 360°$: $3\cos(x) + 3 = 2\sin^2(x)$

B) Solve for θ, where $0° \leq \theta < 360°$: $2\sin\theta\tan\theta + \sqrt{3}\tan\theta = 2\sqrt{3}\sin\theta + 3$

C) How many solutions does the equation $4\sin^2(2007x) - 1 = 0$ have over the interval $0 \leq x < \pi/4$?