

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2016
ROUND 3 TRIG: EQUATIONS WITH A REASONABLE NUMBER OF SOLUTIONS

ANSWERS

A) _____

B) _____

C) _____

A) Compute all values of x over the interval $[0, 2\pi]$ for which $3\sin^2 x + 2\cos x + 2 = 0$.

B) The equation $\cos x(2\sin x + 1) = 0$ has exactly 4 solutions over the interval $0^\circ < x \leq k^\circ$
Compute the minimum value of k .

C) Determine the smallest positive degree-measure of θ for which

$$\sin(3\theta - 160^\circ) = \cos(150^\circ - 2\theta) .$$