

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 - MARCH 2016
ROUND 3 TRIGONOMETRY: ANYTHING**

ANSWERS

A) (_____ , _____)

B) _____

C) _____

A) Over $0 \leq x < 180^\circ$, the equation $2\sin^2 2x + \sin 2x - 1 = 0$ has k solutions that total T° .
Compute the ordered pair (k, T) .

B) Find the coordinates (x, y) of the points of intersection between the Cartesian equation $y = 3x$ and the polar equation $r = 3\cos\theta$.

Recall the conversion identities: $x = r\cos\theta$ and $y = r\sin\theta$.

C) Compute all possible values of x over $0 \leq x < 360^\circ$ for which

$$\cos 140^\circ - \sin 230^\circ + \cos 100^\circ = 2\cos(-300^\circ)(\cos x^\circ).$$