MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 - FEBRUARY 2017
ROUND 3 TRIG: IDENTITIES AND/OR INVERSE FUNCTIONS

ANSWERS

A) _____

B) _____

C) _____

A) Find a simplified expression for $1+\tan^2 x$ strictly in terms of $\sin x$, where $x \neq \frac{\pi}{2}+k\pi$ for all integers *k*. The expression must be in the form $\frac{N}{D}$, where $N > 0$ for all values of *x*.

B) Solve for θ over $[0, 2\pi)$. $\sin 2\theta = \tan\theta$

C) Solve for *x*: $\text{Arccos}(x) + 2\text{Arcsin}(-1) = -\frac{\pi}{6}$