MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 - FEBRUARY 2016
ROUND 3 TRIG: IDENTITIES AND/OR INVERSE FUNCTIONS

ANSWERS

A) _____

B) _____

C) _____

A) For how many values of A, where $90° < A < 2016°$, is $\sin\theta = \cos(A - \theta)$ an identity?

B) For what values of x over $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ does $\sin(4x) = \cos(2x)$?

C) The vertical line $x = \frac{1}{2}$ intersects $y = Cos^{-1}x$ at point A.
At point B, $y = Cos^{-1}x$ attains its maximum value.
At point C, $y = Cos^{-1}x$ attains its minimum value.
A horizontal line through A intersects line $\overleftrightarrow{BC}$ at point D.
Compute AD.