MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 – FEBRUARY 2007
ROUND 3 TRIG: IDENTITIES AND/OR INVERSE FUNCTIONS

ANSWERS

A) _____

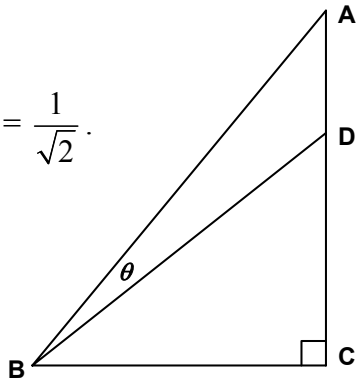
B) _____

C) _____

A) Given $A = Sin^{-1}(\frac{35}{37})$, $B = Cos^{-1}(-\frac{15}{17})$
Find $\sin(A + B)$ as a simplified fraction.

B) In right ΔABC, $m\angle C = 90°$, $m\angle DBC = 45°$, $AB = 1 + \sqrt{2}$ and $\tan(\theta) = \frac{1}{\sqrt{2}}$.
Determine BC in simplified radical form.

Hint: $BC = AB\cos(\angle ABC)$



C) Let $\theta = Arc\cos(\frac{1}{2x+1})$, where $x > 0$. Express the fraction $\frac{x^2+x}{2x+1}$ as a single simplified fraction in terms of $\cos(\theta)$.