MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 - FEBRUARY 2013
ROUND 3 TRIG: IDENTITIES AND/OR INVERSE FUNCTIONS

ANSWERS

A) _____

B) _____

C) y = _____

A) Given: $Arc\sin\left(\frac{5}{7}\right) = Arc\tan(k)$

Determine the value of k <u>in terms of a simplified radical</u>.
If necessary, rationalize the denominator.

B) Let $A = Arc\tan\left(-4\sqrt{3}\right)$. Compute $\sin(\pi + A)$.

C) Given: $\begin{cases} x = 9\cos^4\theta \\ y = 9\sin^4\theta \end{cases}$, where $0 \le \theta < 2\pi$

Clearly, $0 \le x \le 9$ and $0 \le y \le 9$

Express y <u>strictly</u> in terms of x, where $0 \le x \le 9$.