

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 – MARCH 2010
ROUND 3 TRIGONOMETRY: ANYTHING**

ANSWERS

A) _____°

B) _____

C) _____

******* NO CALCULATORS IN THIS ROUND *******

A) Solve for θ , $0^\circ \leq \theta < 360^\circ$.

$$\sin \theta \cos \theta \tan(90^\circ - \theta) \cot(90^\circ + \theta) \sec(270^\circ + \theta) \csc(270^\circ - \theta) = \cot(180^\circ - \theta)$$

B) Robert Wadlow, the world's tallest man, stands x feet tall. Your task is to compute x given the following information:

At 4:00 PM, Robert's shadow is 10 feet longer than his shadow at 2:00 PM.

At 4:00 PM the sun makes a 30° with the ground, but it made a 60° at 2:00 PM.

Recall: An exact answer is required.
The given information is summarized in the diagram.



C) Given: $\begin{cases} \sin A = \frac{k}{\sqrt{41}} \\ \cos A = \frac{k+1}{\sqrt{41}} \end{cases}$ and $k > 0$. Compute $\sec\left(A - \frac{5\pi}{2}\right) \cdot \cos(A - 5\pi)$.