**MASSACHUSETTS MATHEMATICS LEAGUE**
**CONTEST 6 - MARCH 2017**
**ROUND 3 TRIGONOMETRY: ANYTHING**

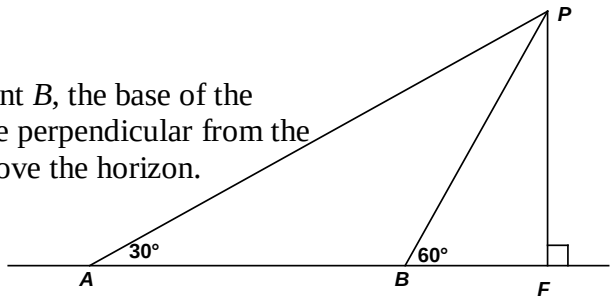
**ANSWERS**

A) _____

B) _____

C) _____

A) When a hiker walking along a level trail stops at point *A*, he notices that the peak of a mountain is 30° above the horizon. When he has walked to point *B*, the base of the mountain, he is still 10,000 feet from the foot of the perpendicular from the peak to the plane of the trail and the peak is 60° above the horizon. Compute the distance from *A* to *B*.




B) Solve for $x$ over $0 \leq x < \pi$. $(\tan x - i\sec x)(\tan x + i\sec x) = 7$, where $i = \sqrt{-1}$.

C) Over the interval $0 \leq x < 2\pi$, the graphs of $y = \sin\left(\frac{5}{2}x\right)$ and $|3y - 2| = 3$ intersect at $k$ points. Compute $k$.