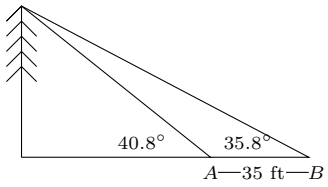
Math 29
PAL Worksheet 23

1. On one side of a river is a tall tree, growing perpendicular to the ground. On the opposite side of the river, from a point A, an observer measures the angle of elevation to the top of the tree to be $40.8°$. Moving an additional 35 feet beyond point A to a point B, the angle of elevation is now measured to be $35.8°$. How tall is the tree? (Put your calculator in degree mode for this problem.)



2. Find the value of each expression:
   a. $\sin(\sin^{-1} 0.456)$
   b. $\cos^{-1}(\cos 2.5)$
   c. $\cos^{-1}(\cos\left(\frac{5\pi}{3}\right))$
   d. $\tan^{-1}\left(\tan\frac{4\pi}{3}\right)$

3. Find the exact value of $\sin\left(\cos^{-1}\frac{2}{5}\right)$.

4. Verify each of the identities:
   a. $1 - 2\sin^2 x = 2\cos^2 x - 1$
   b. $\csc^2 x - \cos^2 x \csc^2 x = 1$
   c. $\dfrac{\sin x + \tan x}{1 + \cos x} = \tan x$