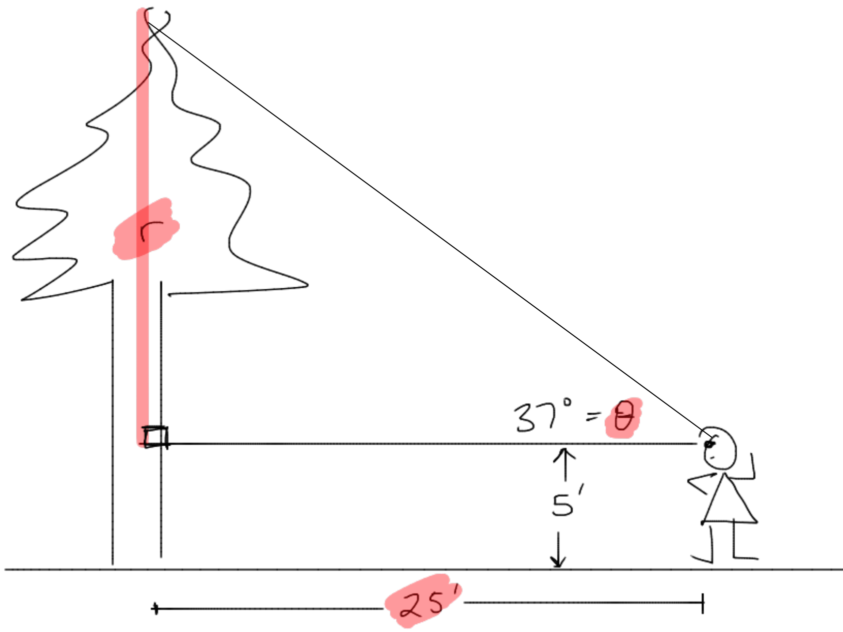


$5 \text{ hands} = 90°$

$\text{hand} = \frac{90°}{5} = 18°$

tree height $= r + 5$, $\quad \tan\theta = \frac{r}{25}$

$\tan\theta = \tan 37° = \frac{r}{25}$ so $r = 25 \times \tan 37°$

$\approx 23.8'$

tree height $= 25\tan 37° + 5$

Similar Calc.

Height $= h+5 \approx 54'$

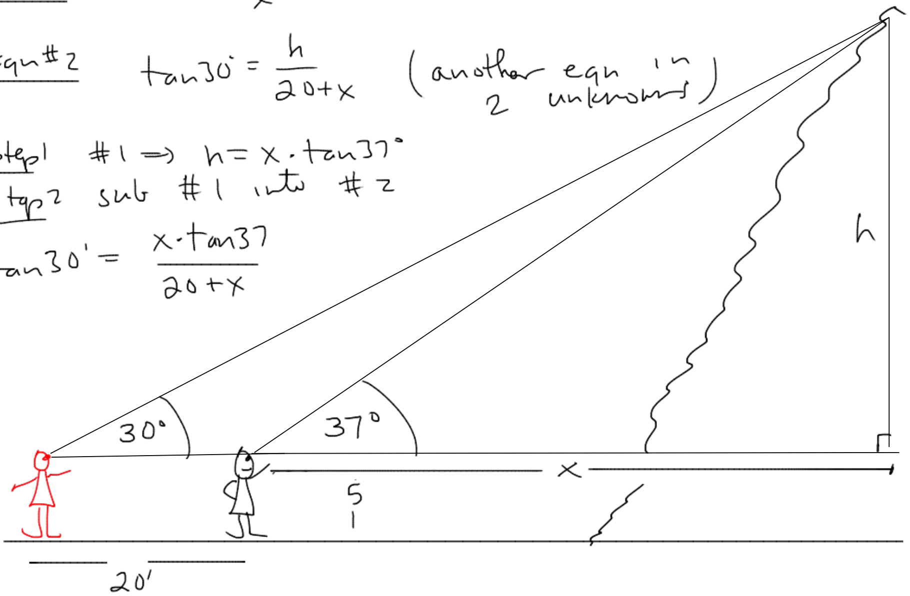
Eqn #1 $\tan 37^\circ = \frac{h}{x}$ (1 eqn in 2 unknowns)

Eqn #2 $\tan 30^\circ = \frac{h}{20+x}$ (another eqn in 2 unknowns)

Step 1 #1 $\Rightarrow h = x \cdot \tan 37^\circ$

step 2 sub #1 into #2

$\tan 30^\circ = \frac{x \cdot \tan 37}{20+x}$



Bonus! (1 week from Today) in you do this

step 3 cross mult

$(20+x)\tan 30^\circ = x \cdot \tan 37$

$20\tan 30 + x\tan 30^\circ =$

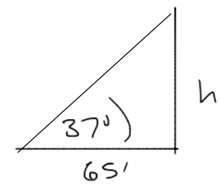
$20\tan 30 = x\tan 37 - x\tan 30^\circ$

$= x(\tan 37 - \tan 30^\circ)$

$\frac{20\tan 30}{\tan 37 - \tan 30} = x$

$65' \approx x$

step 5



$\tan 37 = \frac{h}{65}$

$65 \cdot \tan 37 = h = 49.3'$

warm-up:

Solve (Find all sols ... exact) or $\cos(x) = \frac{1}{2}$

$\cos^{-1}(\cos(x)) = \cos^{-1}(\frac{1}{2})$

1. $2\cos(x) = 1$

$$\boxed{\begin{array}{l} \frac{\pi}{3} + 2k\pi \\ \frac{5\pi}{3} + 2k\pi \end{array}}$$

$x = \cos^{-1}(\frac{1}{2}) = 60°$

$\cos(x) = \frac{1}{2}$

to get other sol'n

cos( )

$360° - 60° = 300°$

(where on unit circle does x-coord is $\frac{1}{2}$

2. $\tan\theta = 1$

slope $= \frac{y}{x}$

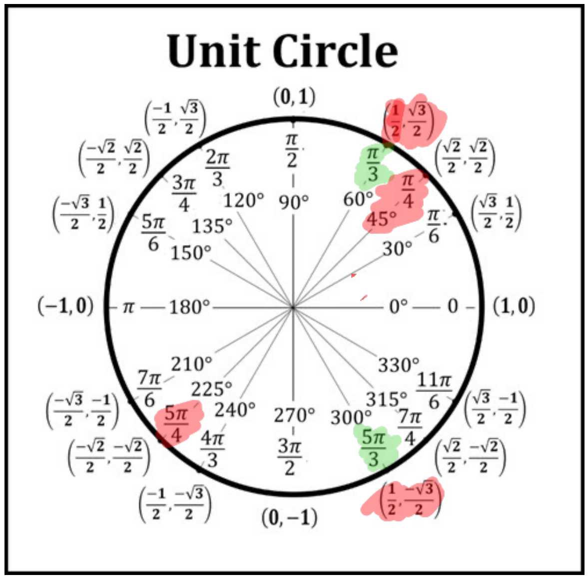
calculator?

$\theta = 45°$

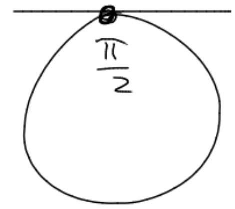
$\theta = 180° + 45° = 225°$

$45° + 180° \cdot k$

$225° + 180° \cdot k$



More equations:



$$\sin(2x) = 1$$

this means angle $2x$ gives y-coord $= 1$.

ex. $2x = \frac{\pi}{2}$

or

$2x = \frac{\pi}{2} + 2\pi = \frac{5\pi}{2}$

$$\boxed{\text{or} \quad 2x = \frac{\pi}{2} + 2\pi k}$$

so $x = \frac{\pi}{4} + \pi k$