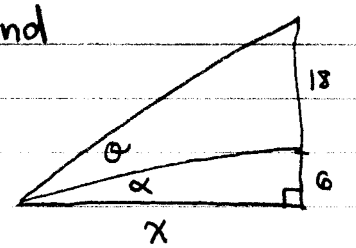
Where to Stand



Let x = distance from wall.

$$\cot(\theta+\alpha) = \frac{x}{24} \rightarrow \theta+\alpha = \cot^{-1}\left(\frac{x}{24}\right) \rightarrow \theta = \cot^{-1}\left(\frac{x}{24}\right) - \alpha$$

$$\cot(\alpha) = \frac{x}{6} \longrightarrow \alpha = \cot^{-1}\left(\frac{x}{6}\right) \longrightarrow \theta = \cot^{-1}\left(\frac{x}{24}\right) - \cot^{-1}\left(\frac{x}{6}\right)$$

$$\frac{d\theta}{dx} = \frac{-1}{1+\left(\frac{x}{24}\right)^2}\cdot\frac{1}{24} - \frac{-1}{1+\left(\frac{x}{6}\right)^2}\cdot\frac{1}{6} = 0$$

solve: $\dfrac{1}{6\left[1+\left(\frac{x}{6}\right)^2\right]} = \dfrac{1}{24\left[1+\left(\frac{x}{24}\right)^2\right]}$

Solve: $6 + \dfrac{6\cdot x^2}{6^2} = 24 + \dfrac{24\cdot x^2}{24^2}$

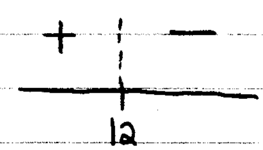
solve: $6 + \dfrac{x^2}{6} = 24 + \dfrac{x^2}{24}$

solve: $\dfrac{x^2}{8} = 18$

solve: $x^2 = 144$

$x = 12$ ft. (since $x>0$)

Sign chart



Since $\frac{d\theta}{dx}$ changes sign from pos. to neg. at $x=12$.

The 1st derivative test tells us there is a local max. there.