

Section 7.4

Solutions and Hints

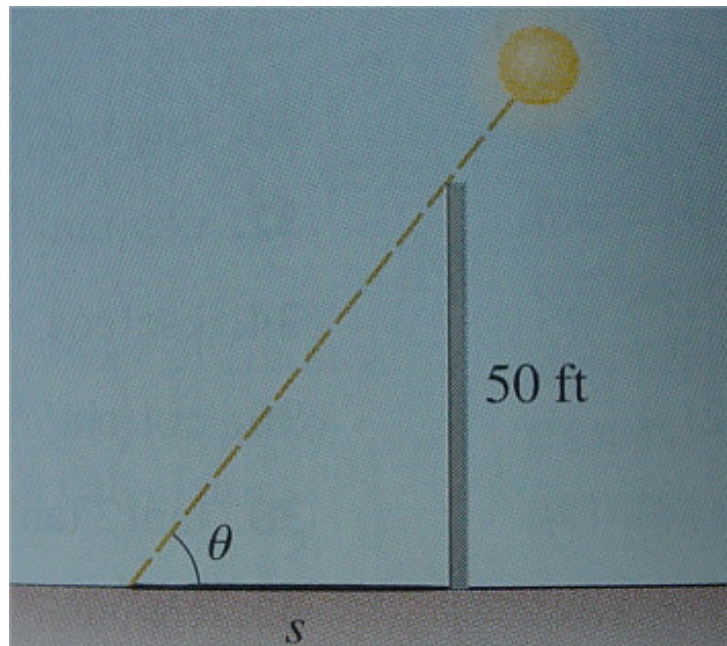
by Brent M. Dingle

for the book:

Precalculus, Mathematics for Calculus 4th Edition
by James Stewart, Lothar Redlin and Saleem Watson.

50. A 50 ft pole casts a shadow as shown.

50a. Express the angle of elevation, θ , of the sun as a function of the length of the shadow, s .



$$\begin{aligned}\tan(\theta) &= \text{opposite} / \text{adjacent} = 50 / s \rightarrow \tan^{-1}(\tan(\theta)) = \tan^{-1}(50 / s) \\ &\rightarrow \theta = \tan^{-1}(50 / s)\end{aligned}$$

50b. Find the angle θ of elevation of the sun when the shadow is 20 ft long.

$$\theta = \tan^{-1}(50 / s) = \tan^{-1}(50 / 20) = \pi/2 - \tan^{-1}(2/5) \cong \mathbf{1.19 \text{ radians}} \cong 68.2^\circ.$$