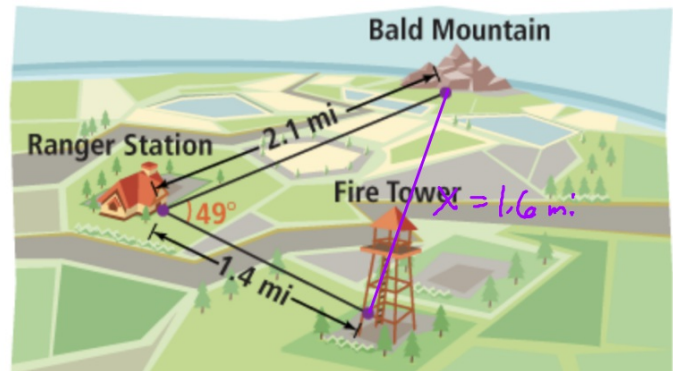


The district ranger wants to build a new ranger station at the location of the fire tower because it would be closer to Bald Mountain than the old station is. Is the district ranger correct? Explain.

**SOLUTION**

$$x^2 = 2.1^2 + 1.4^2 - 2(2.1)(1.4)\cos 49$$



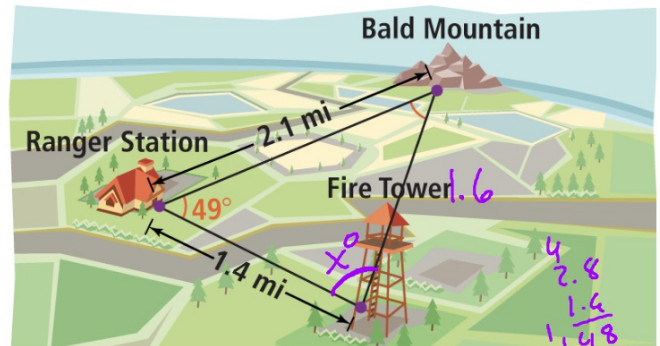
4. Assume a path is drawn from the fire tower to Bald Mountain. What is the angle the new path forms with the old path from Bald Mountain to the ranger station?

$$\frac{1.6}{\sin 49^\circ} = \frac{2.1}{\sin X^\circ}$$

$$1.6 \sin X = 2.1 \sin 49^\circ$$

$$\sin X = \frac{2.1 \sin 49^\circ}{1.6}$$

$$\sin^{-1} \left( \frac{2.1 \sin 49^\circ}{1.6} \right)$$



$$2.1^2 = 1.4^2 + 1.6^2 - 2(1.4)(1.6) \cos X^\circ$$

$$4.41 = 1.96 + 2.56 - 4.48 \cos X^\circ$$

$$4.41 = 4.52 - 4.48 \cos X$$

$$-0.11 = -4.48 \cos X^\circ$$

$$\frac{.11}{4.48} = \cos X$$

$$\cos^{-1} \left( \frac{.11}{4.48} \right) = 88.6^\circ$$

$$\begin{array}{r} 4.48 \\ \times 1.6 \\ \hline 280 \\ 148 \\ \hline 4.28 \end{array}$$