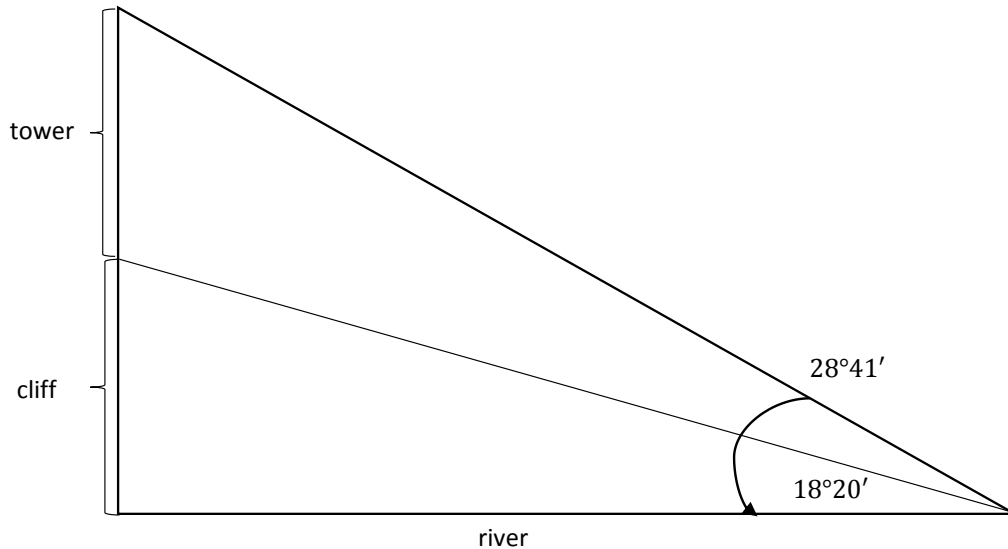


Answer on question #35312 – Math – Geometry

A tower 125 ft high is on the cliff on the bank of a river. From the top of the tower the angle of depression of a point on the opposite shore is $28^{\circ}41'$ and from the base of the tower the angle of depression of the same point is $18^{\circ}20'$ (a) Find the width of the river and (b) height of the cliff

Answer



Let x is the high of cliff. And y is the width of river. Then we get the system of two equations.

$$\begin{cases} \tan 28^{\circ}41' = \frac{x + 125}{y} \\ \tan 18^{\circ}20' = \frac{x}{y} \end{cases}$$

$$\begin{cases} y \tan 28^{\circ}41' = x + 125 \\ x = y \tan 18^{\circ}20' \end{cases}$$

$$y \tan 28^{\circ}41' = y \tan 18^{\circ}20' + 125$$

$$y(\tan 28^{\circ}41' - \tan 18^{\circ}20') = 125$$

$$y = \frac{125}{(\tan 28^{\circ}41' - \tan 18^{\circ}20')} \approx 580,32 \text{ ft.}$$

$$x = 580,32 \tan 18^{\circ}20' \approx 192.26 \text{ ft.}$$

Answer: (a) 580,32 ft.; (b) 192.26 ft.