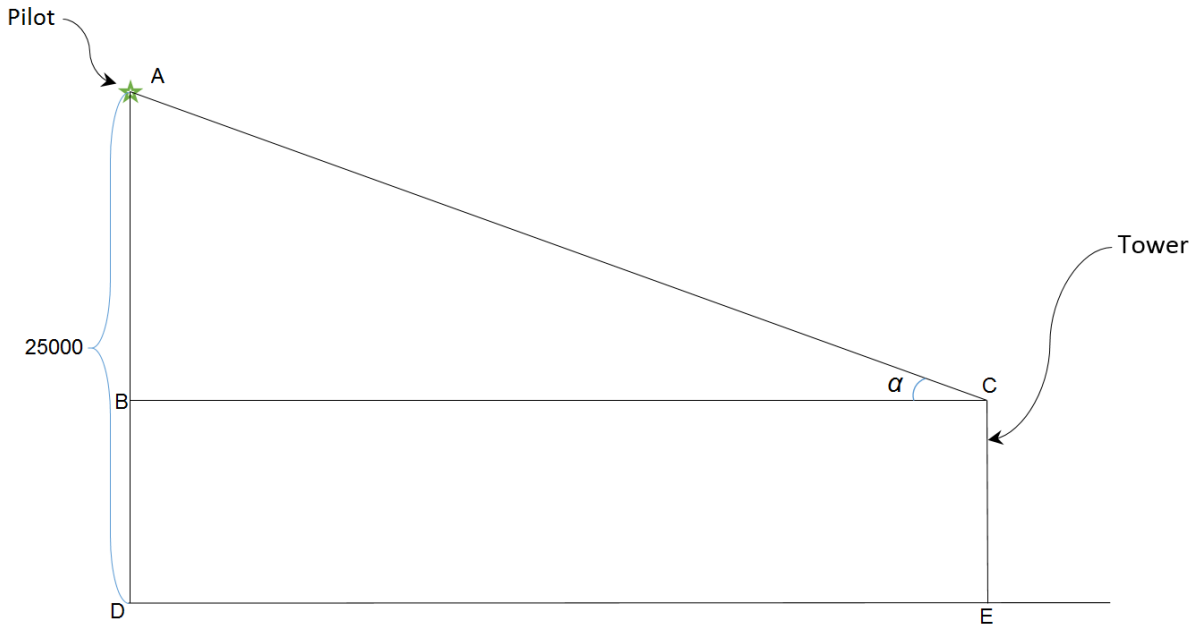
At a height of $25000$ ft, a pilot finds the angle of depression of the top of the tower as $25° 30'$. How far is he from the top of the tower? The tower is $500$ ft. high.

**Solution.**




The angle of depression of the top of the tower is $\alpha$. We must find a distance from the pilot to the top of the tower $AC$.

Use the sine function to find it:

$$\sin\alpha = \frac{AB}{AC}$$

$$AC = \frac{AB}{\sin\alpha}$$

$$AB = AD - BD = AD - CE = 25000 - 500 = 24500 \text{ (ft)}$$

$$\alpha = 25° 30' = 25° + 30' \cdot \frac{1°}{1°} = |1° = 60'| = 25° + 30' \cdot \frac{1°}{60'} = 25° + \frac{30'}{60'} \cdot 1° = 25.5°$$

So

$$AC = \frac{24500}{\sin 25.5°} \approx \frac{24500}{0.43} = 56976.7 \text{ (ft)}$$

**Answer:** $56976.7$ ft.