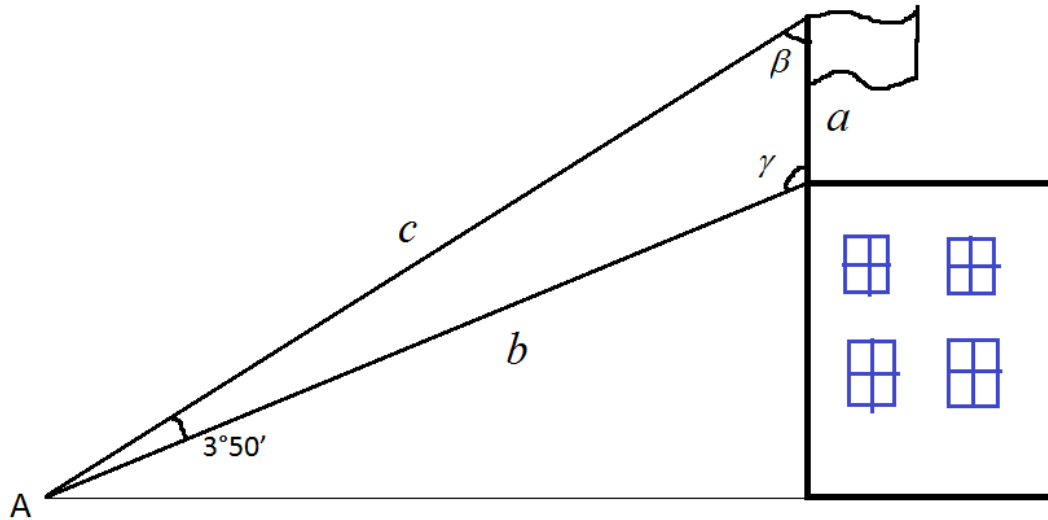


Answer on Question #77730 – Math – Trigonometry

Question

A flagpole 25 ft high, standing on the edge of the roof of a high building, when seen from a point A on the ground subtends an angle of $3^{\circ}50'$. If A is 200 ft from the bottom of the pole, how far is it from the top?

Solution



Given:

$$a = 25 \text{ ft,}$$

$$b = 200 \text{ ft,}$$

$$\alpha = 3^{\circ}50' = 3.833^{\circ},$$

$$c = ?$$

The equation for the angle β can be implied from the law of sines:

$$\sin \beta = \frac{b}{a} \sin \alpha$$

$$\sin \beta = \frac{200}{25} \sin 3^{\circ}50' = 0.5348$$

$$\beta = \sin^{-1} 0.5348 = 32.33^{\circ}$$

The third angle is

$$\gamma = 180^{\circ} - \alpha - \beta = 180^{\circ} - 3.833^{\circ} - 32.33^{\circ} = 143.837^{\circ}$$

The third side can then be found from the law of sines:

$$c = a \frac{\sin \gamma}{\sin \alpha} = 25 \cdot \frac{\sin 143.837^{\circ}}{\sin 3.833^{\circ}} = 220.7 \text{ ft}$$

Answer: 220.7 ft