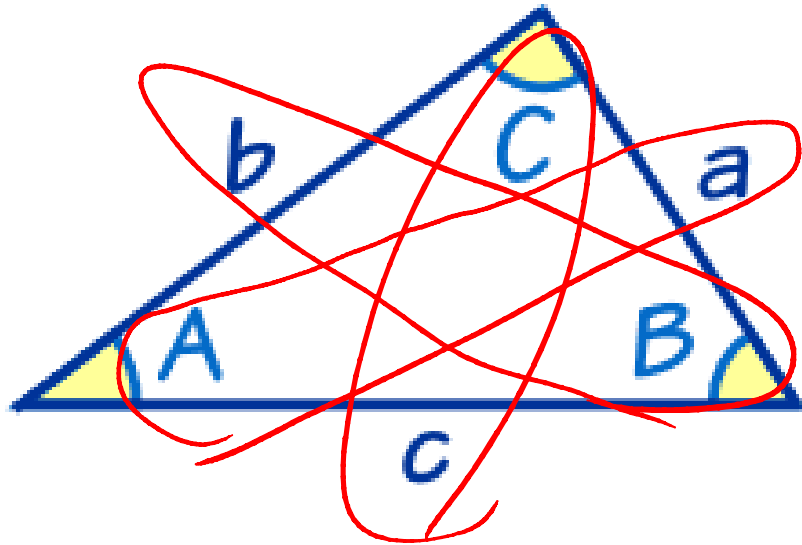


Mathematics 11U

5.6 – Sine Law

Mr. D. Hagen

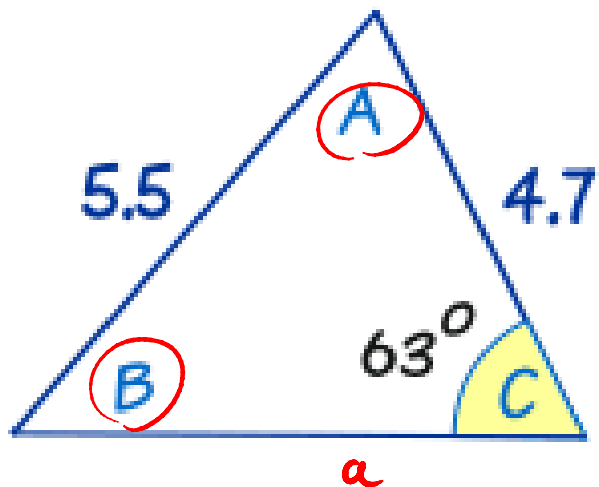
Given $\triangle ABC$:



$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Solve $\triangle ABC$:



$$\textcircled{1} \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{\sin B}{4.7} = \frac{\sin 63}{5.5}$$

$$B = \sin^{-1}\left(\frac{4.7 \sin 63}{5.5}\right)$$

$$B = 49.58^\circ \approx 50^\circ$$

$$\angle A = 67^\circ \quad a = 5.7$$

$$\angle B = 50^\circ \quad b = 4.7$$

$$\angle C = 63^\circ \quad c = 5.5$$

$$\textcircled{2} \angle A = 180 - 50 - 63$$
$$\angle A = 67^\circ$$

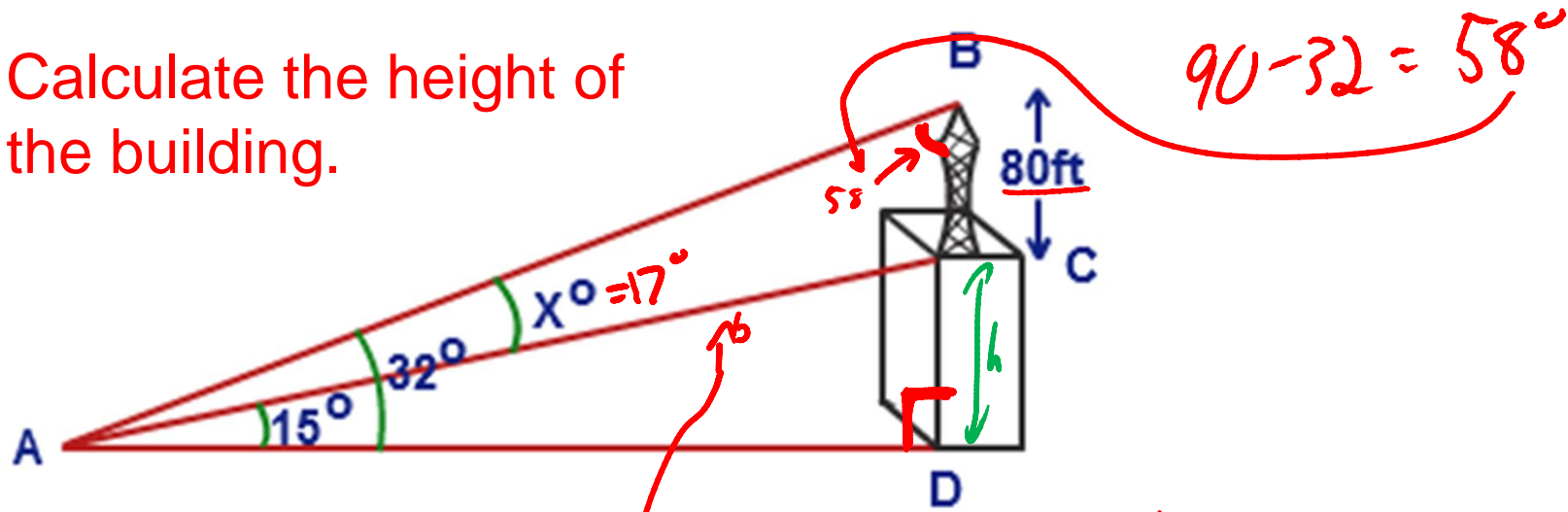
$$\textcircled{3} \frac{a}{\sin A} = \frac{c}{\sin C}$$

$$\frac{a}{\sin 67} = \frac{5.5}{\sin 63}$$

$$a = \frac{5.5 \sin 67}{\sin 63}$$

$$a = 5.7$$

Calculate the height of the building.



$$\frac{b}{\sin 58} = \frac{80}{\sin 17}$$

$$b = \frac{80 \sin 58}{\sin 17}$$

$$b = 232\text{ft}$$

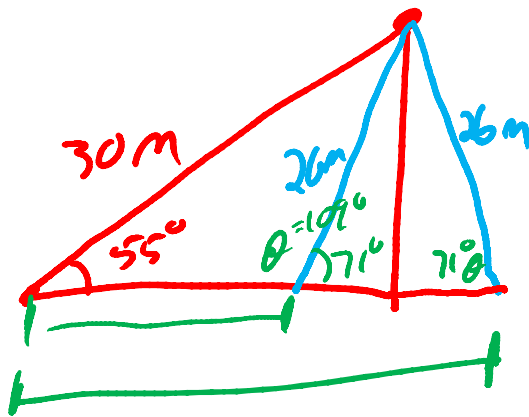
$$\sin 15 = \frac{h}{232}$$

$$232 \sin 15 = h$$

$$\underline{\underline{60\text{ft} = h}}$$

A word problem with an issue:

A tower is supported by guy wires. One wire is 30m with an angle of elevation of 55° . Another wire is 26m. How far apart are these two wires? Assume the wires attach at the same spot.

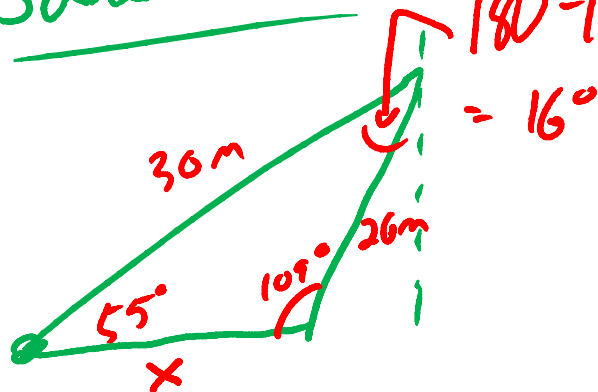


$$\frac{\sin \theta}{30} = \frac{\sin 55}{26}$$

$$\theta = \sin^{-1} \left(\frac{30 \sin 55}{26} \right)$$

$$\theta = 71^\circ$$

Same Side

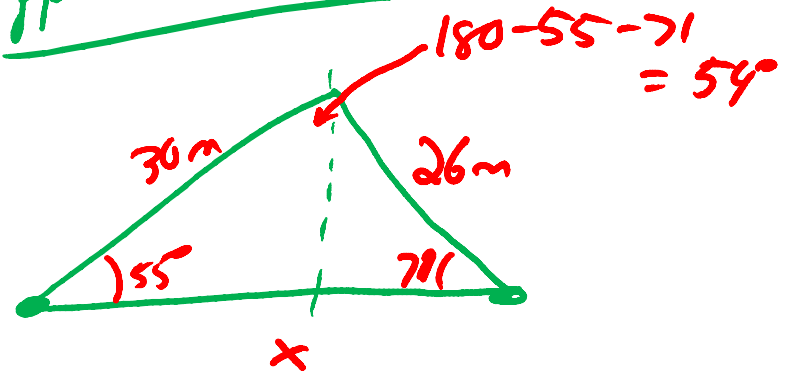


$$\frac{x}{\sin 16} = \frac{26}{\sin 55}$$

$$x = \frac{26 \sin 16}{\sin 55}$$

$$x = 8.7m$$

Opposite Sides



$$\frac{x}{\sin 54} = \frac{26}{\sin 55}$$

$$x = \frac{26 \sin 54}{\sin 55}$$

$$x = 25.7m$$