

Trigonometry test is tomorrow!!

There are three "laws" we learned:

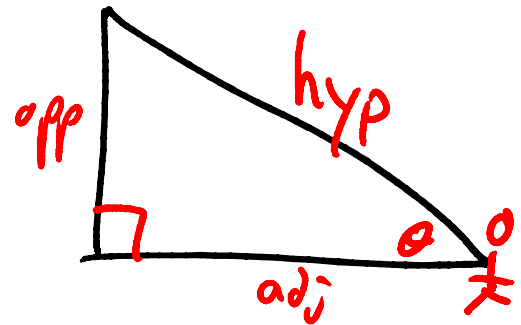
- sohcahtoa

↳ right angled triangles

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

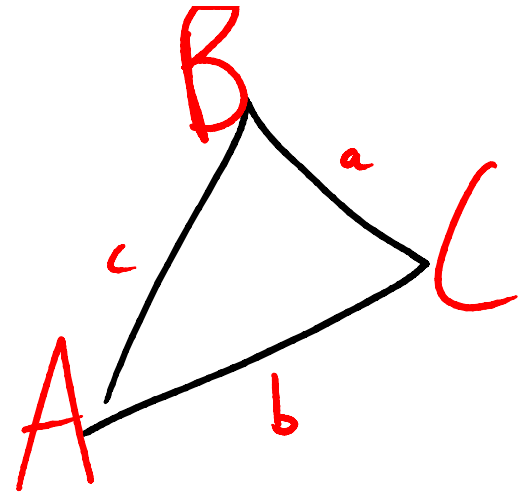
$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$



- Sine law

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

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



Required: one pair and one other thing

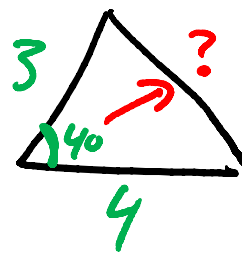
↳ one full ratio or an angle
and its side.

- cosine law

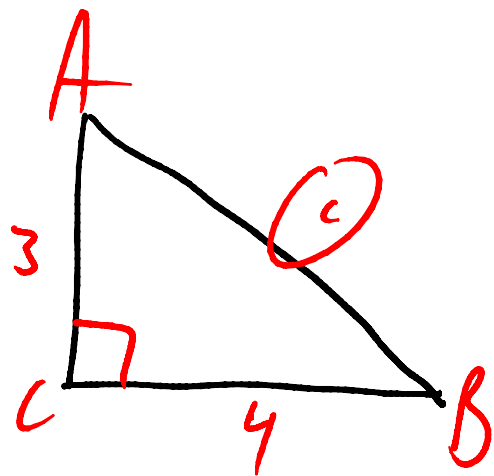
$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$C = \cos^{-1} \left(\frac{c^2 - a^2 - b^2}{-2ab} \right)$$

Required: 2 sides and the contained angle



3 sides, you can find any angle

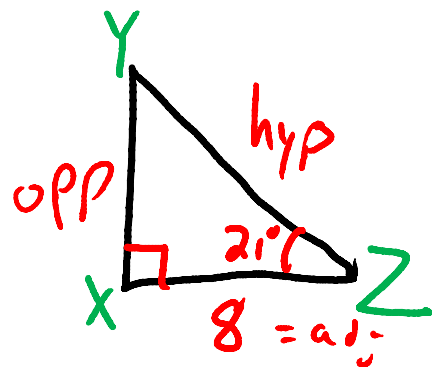


$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$\underline{c^2 = 4^2 + 3^2 - 2(3)(4) \cos 90^\circ}$$

$= 0$

Solve



$$X = 90^\circ \quad x = 8.6$$

$$Y = 69^\circ \quad y = 8$$

$$Z = 21^\circ \quad z = 3.1$$

$$\textcircled{1} Y = 180 - X - Z$$

$$Y = 180 - 90 - 21$$

$$Y = 69^\circ$$

$$\textcircled{2} \cos 21^\circ = \frac{8}{x}$$

$$x = \frac{8}{\cos 21}$$

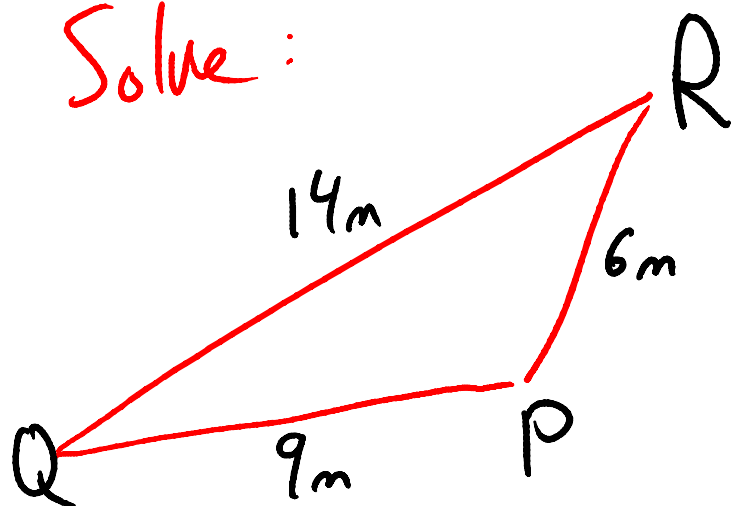
$$x = 8.6$$

$$\textcircled{3} \sin 21 = \frac{z}{8.6}$$

$$8.6 \sin 21 = z$$

$$3.1 = z$$

Solve:



$$① P = \cos^{-1} \left(\frac{p^2 - q^2 - r^2}{-2qr} \right)$$

$$P = \cos^{-1} \left(\frac{14^2 - 6^2 - 9^2}{-2(6)(9)} \right)$$

$$P = \cos^{-1} \left(\frac{79}{-108} \right)$$

$$P = 137^\circ$$

$$\begin{aligned} P &= 137^\circ & p &= 14 \\ Q &= 17^\circ & q &= 6 \\ R &= 26^\circ & r &= 9 \end{aligned}$$

$$② \frac{\sin Q}{q} = \frac{\sin P}{p}$$

$$\frac{\sin Q}{6} = \frac{\sin 137^\circ}{14}$$

$$Q = \sin^{-1} \left(\frac{6 \sin 137^\circ}{14} \right)$$

$$Q = 17^\circ$$

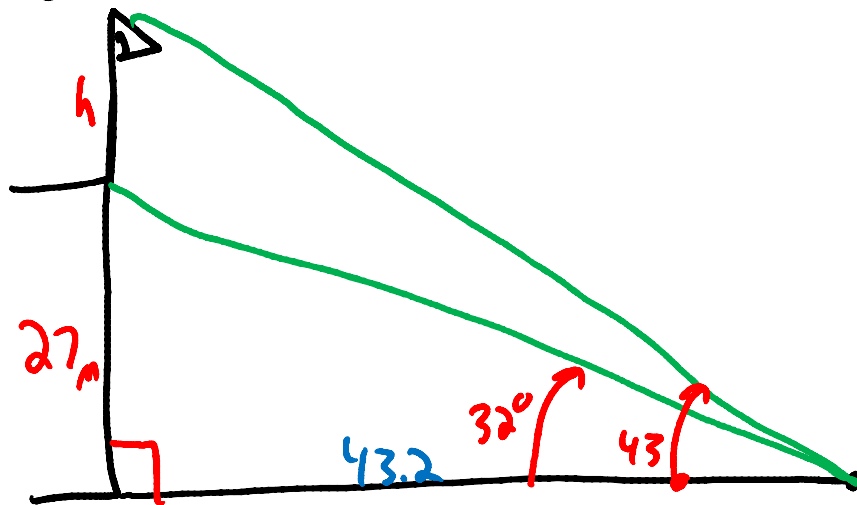
$$③$$

$$R = 180^\circ - P - Q$$

$$R = 180^\circ - 137^\circ - 17^\circ$$

$$R = 26^\circ$$

pg 450 #7



$$a) \tan 32 = \frac{27}{a}$$

$$a = \frac{27}{\tan 32}$$

$$a = 43.2 \text{ m}$$

$$b) \tan 43 = \frac{0}{43.2}$$

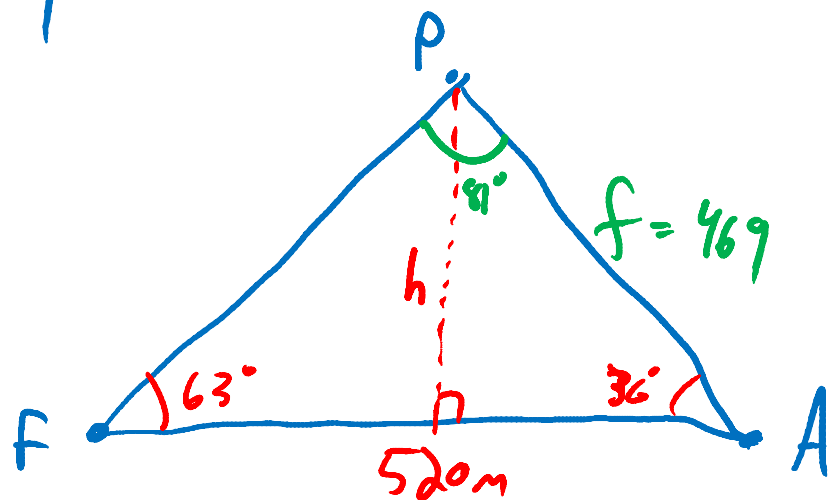
$$43.2 \tan 43 = 0$$

$$40.3 = 0$$

$\therefore$ the flagpole is

$$40.3 - 27 = 13.3 \text{ m tall!}$$

#9



$$\textcircled{1} P = 180 - 63 - 36$$

$$P = 81^\circ$$

$$\textcircled{2} \frac{f}{\sin 63} = \frac{520}{\sin 81}$$

$$f = \frac{520 \sin 63}{\sin 81}$$

$$f = 469m$$

$$\textcircled{3} \sin 36 = \frac{\text{height}}{469}$$

$$469 \sin 36 = \text{height}$$

$$276m = \text{height of airplane}$$