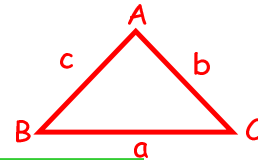


1.5 Sine Law

For oblique triangles (non-right angles)



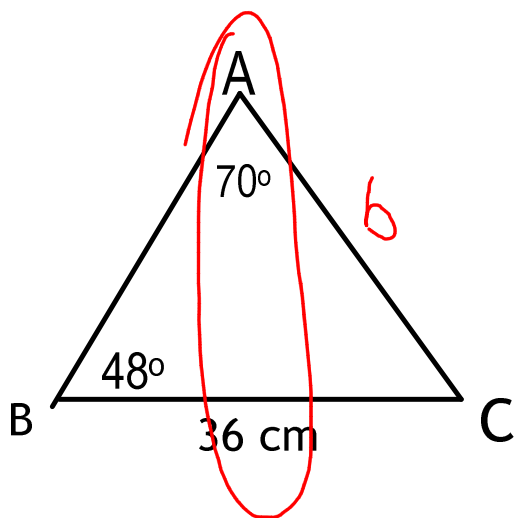
find a side

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

find an angle

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

Ex 1 - Find b.



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

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

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

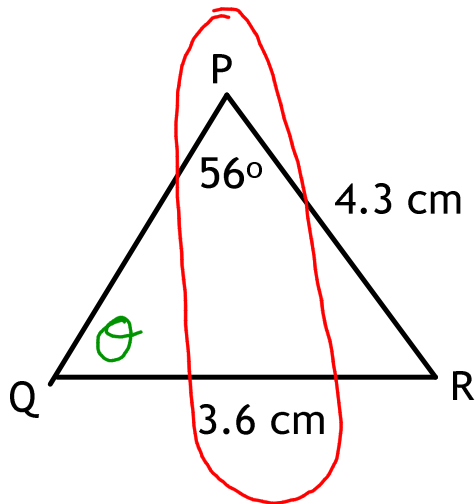
$$\frac{b}{\sin 48^\circ} = \frac{36}{\sin 70^\circ}$$

$$b = \sin 48 \cdot \frac{36}{\sin 70^\circ}$$

$$\approx 28.47$$

$$\approx 28.5$$

Ex. 2 - Find angle Q



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

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

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

$$\frac{\sin Q}{4.3} = \frac{\sin 56^\circ}{3.6}$$

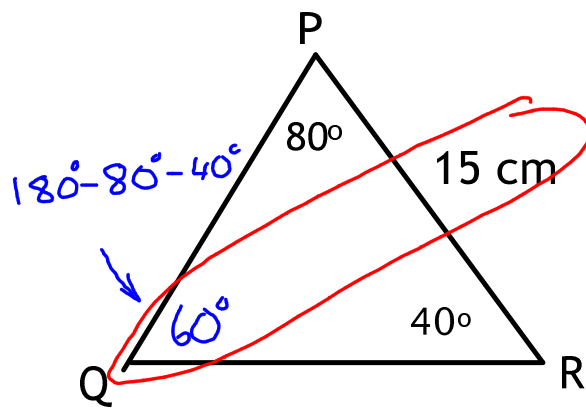
$$\sin Q = 4.3 \cdot \frac{\sin 56^\circ}{3.6}$$

$$\sin Q = 0.9902$$

$$Q = \sin^{-1}(0.9902)$$

$$= 82^\circ$$

Ex. 3 - Solve the triangle.



side p

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

$$\frac{p}{\sin 80^\circ} = \frac{15}{\sin 60^\circ}$$

$$p = \sin 80^\circ \cdot \frac{15}{\sin 60^\circ}$$

$$\approx 17.1 \text{ cm}$$

side R

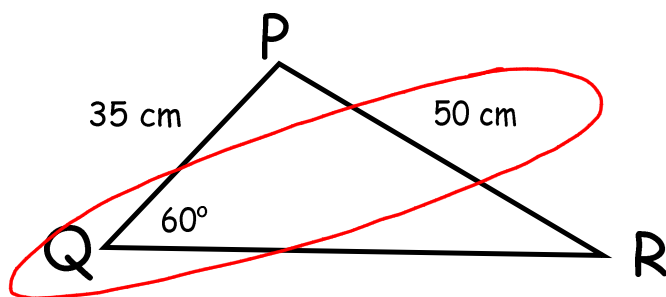
$$\frac{r}{\sin R} = \frac{q}{\sin Q}$$

$$\frac{r}{\sin 40^\circ} = \frac{15}{\sin 60^\circ}$$

$$r = \sin 40^\circ \cdot \frac{15}{\sin 60^\circ}$$

$$\approx 11.1 \text{ cm}$$

Ex 4: Find angle P



$$\frac{\sin R}{r} = \frac{\sin Q}{q}$$

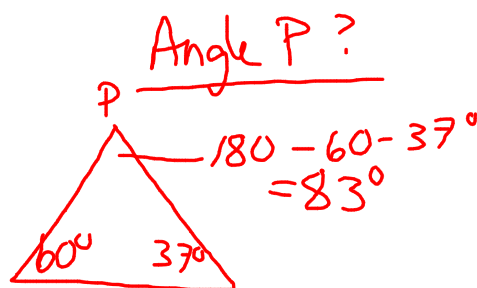
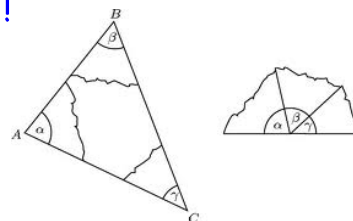
$$\frac{\sin R}{35} = \frac{\sin 60^\circ}{50}$$

$$\sin R = 35 \cdot \frac{\sin 60^\circ}{50}$$

$$\sin R = 0.6062$$

$$R = 37^\circ$$

HINT!



Practice
p. 31 #1b, 2b,
3b, 4b, 8, 10

