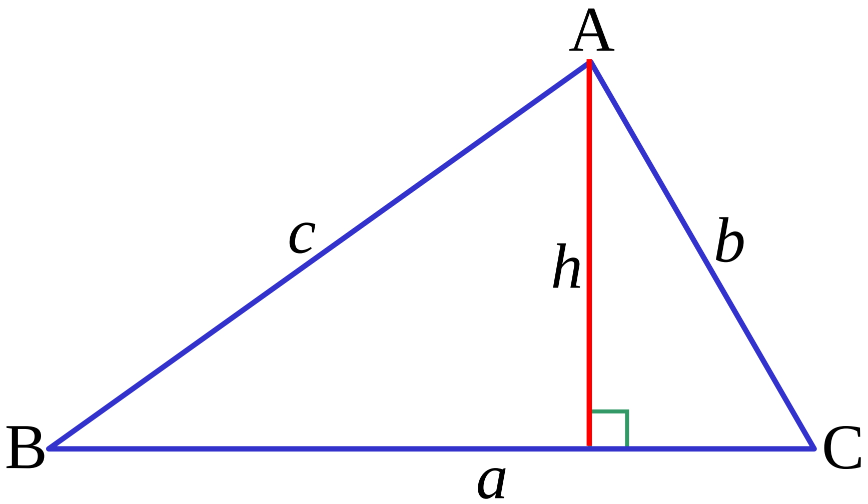
Sine Rule



$$\frac{h}{c} = \sin B \qquad \frac{h}{b} = \sin C$$

$$h = c\sin B \qquad h = b\sin C$$

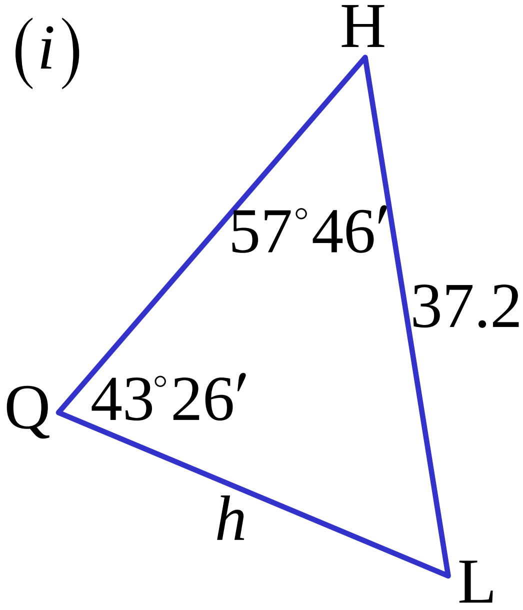
$$\therefore c\sin B = b\sin C$$

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

In any ΔABC

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

e.g. (i)



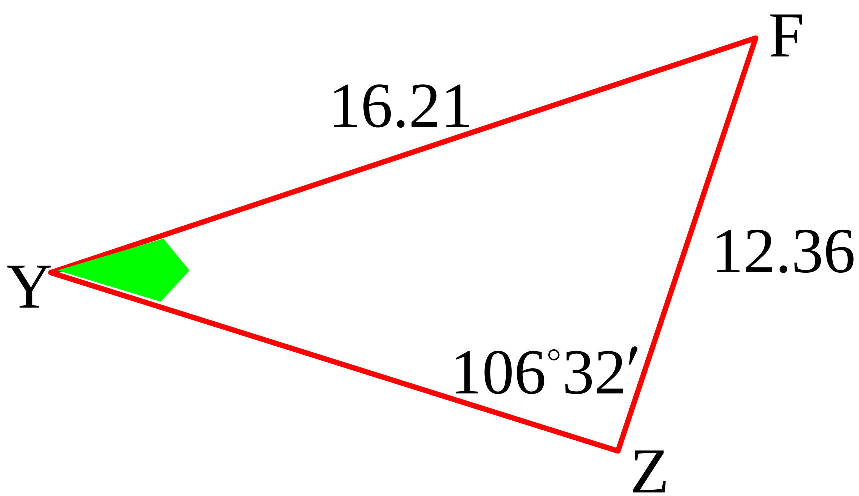
$$\frac{h}{\sin H} = \frac{q}{\sin Q}$$

$$\frac{h}{\sin 57^\circ 46'} = \frac{37.2}{\sin 43^\circ 26'}$$

$$h = \frac{37.2 \sin 57^\circ 46'}{\sin 43^\circ 26'}$$

$\underline{h = 45.8 \text{ units}}$ (to 1 dp)

(ii)



$$\frac{\sin Y}{y} = \frac{\sin Z}{z}$$

$$\frac{\sin Y}{12.36} = \frac{\sin 106^\circ 32'}{16.21}$$

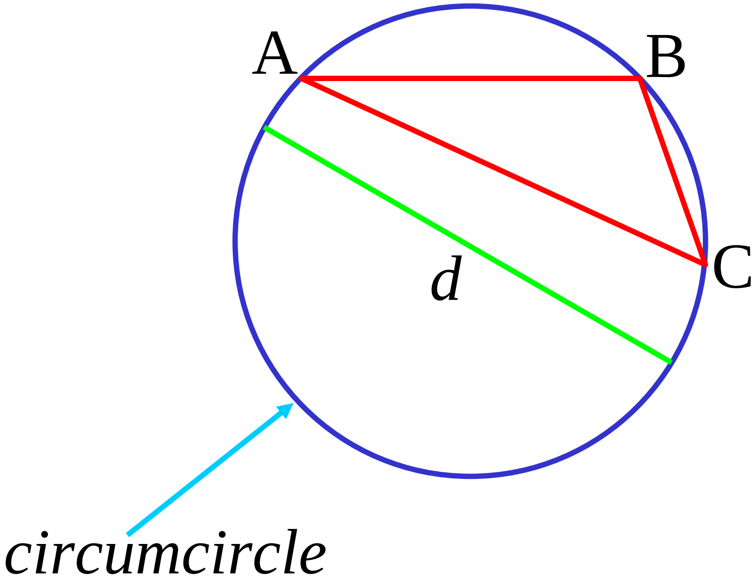
$$\sin Y = \frac{12.36 \sin 106^\circ 32'}{16.21}$$

$$\underline{Y = 46^\circ 58'}$$

Note: does your answer make sense?

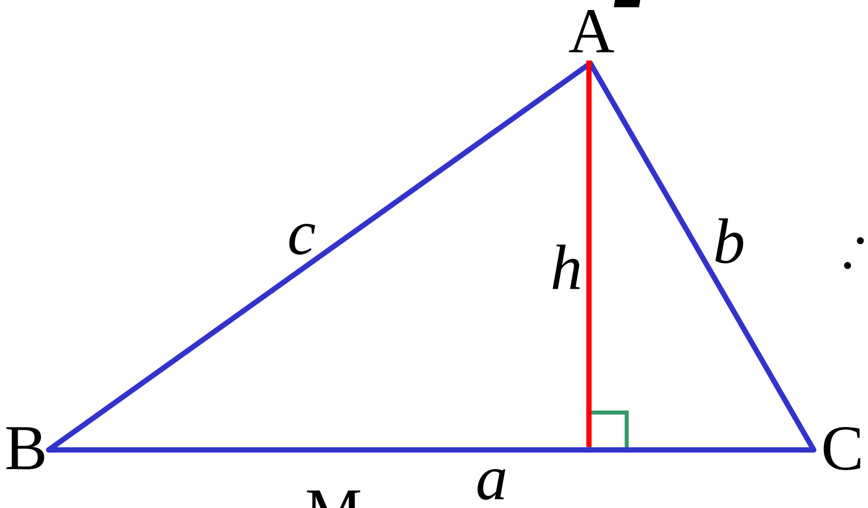
Check whether your answer might be obtuse, remember;

- angle sum $\Delta = 180^\circ$
- largest angle is opposite the largest side



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

Area of a Triangle



$$\text{Area} = \frac{1}{2}ah$$

$$\frac{h}{b} = \sin C$$

$$h = b\sin C$$

$$\therefore \text{Area} = \frac{1}{2}ab\sin C$$

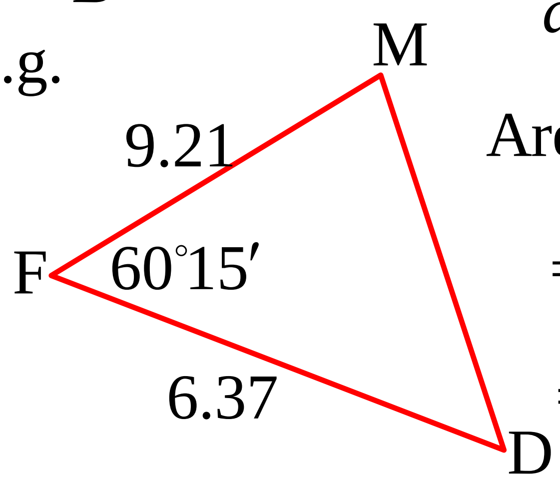
In any ΔABC

$$\text{Area} = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}bc\sin A$$

$$= \frac{1}{2}ac\sin B$$

e.g.



$$\text{Area} = \frac{1}{2}dm\sin F$$

$$= \frac{1}{2}(9.21)(6.37)\sin 60^\circ 15'$$

$$= 25.47 \text{ units}^2 \quad \text{(to 2 dp)}$$

Exercise 4H; 1a, 2b, 3a, 4, 8, 9, 10, 12, 14, 16, 18, 20, 22*