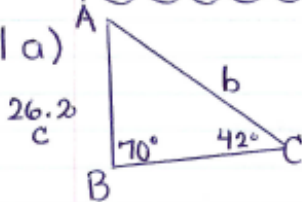


SOLUTIONS => LAW OF SINES WORKSHEET

1 a)



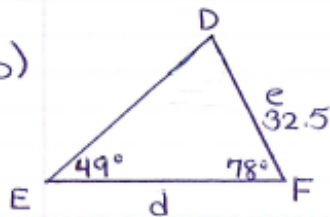
$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{b}{\sin 70^\circ} = \frac{26.2}{\sin 42^\circ}$$

$$b \sin 42^\circ = \frac{26.2 \sin 70^\circ}{\sin 42^\circ}$$

$$b = 36.8$$

b)

First, you will need to find $\angle D$:

$$\angle D = 180^\circ - 49^\circ - 78^\circ$$

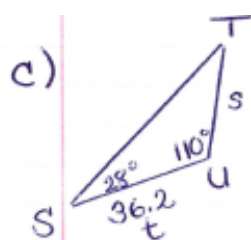
$$= 53^\circ$$

$$\frac{d}{\sin D} = \frac{e}{\sin E}$$

$$\frac{d}{\sin 53^\circ} = \frac{32.5}{\sin 49^\circ}$$

$$d \sin 49^\circ = \frac{32.5 \sin 53^\circ}{\sin 49^\circ}$$

$$d = 34.4$$



First, you need to find $\angle T$:

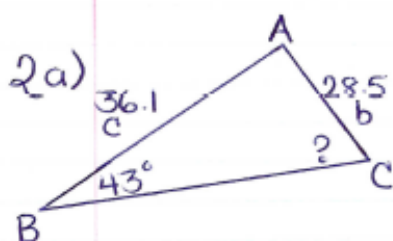
$$\angle T = 180^\circ - 110^\circ - 28^\circ \\ = 42^\circ$$

$$\frac{s}{\sin S} = \frac{t}{\sin T}$$

$$\frac{s}{\sin 28^\circ} = \frac{36.2}{\sin 42^\circ}$$

$$s \frac{\sin 42^\circ}{\sin 42^\circ} = \frac{36.2 \sin 28^\circ}{\sin 42^\circ}$$

$$s = 25.4$$



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

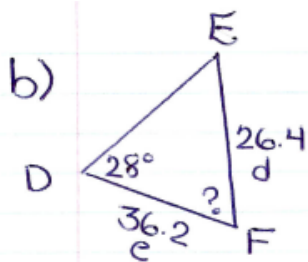
$$\frac{\sin 43^\circ}{28.5} = \frac{\sin C}{36.1}$$

$$\frac{36.1 \sin 43^\circ}{28.5} = \frac{28.5 \sin C}{28.5}$$

$$0.8639 = \sin C$$

$$\sin^{-1}(0.8639) = C$$

$$60^\circ = C$$



In order to find $\angle F$, we will need to find $\angle E$ first.

$$\frac{\sin E}{e} = \frac{\sin D}{d}$$

$$\frac{\sin E}{36.2} = \frac{\sin 28^\circ}{26.4}$$

$$\frac{26.4 \sin E}{26.4} = \frac{36.2 \sin 28^\circ}{26.4}$$

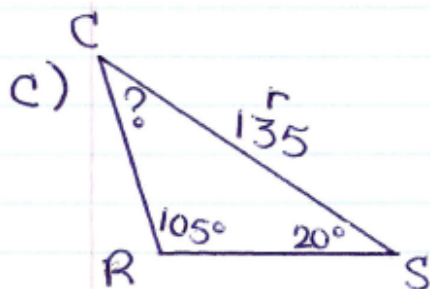
$$\sin E = 0.6437$$

$$E = \sin^{-1}(0.6437)$$

$$E = 40^\circ$$

$$\angle F = 180^\circ - 40^\circ - 28^\circ$$

$$\angle F = 112^\circ$$



$$\angle C = 180^\circ - 105^\circ - 20^\circ$$

$$\angle C = 55^\circ$$



$$\sin P = \sin Q$$

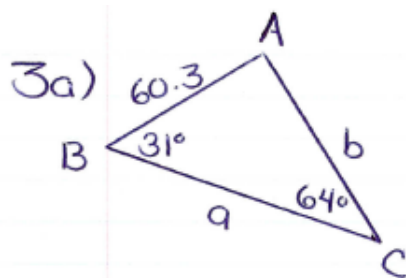
$$\frac{\sin P}{60.3} = \frac{\sin 35^\circ}{38.2}$$

$$\frac{38.2 \sin P}{38.2} = \frac{60.3 \sin 35^\circ}{38.2}$$

$$\sin P = 0.9054$$

$$P = \sin^{-1}(0.9054)$$

$$P = 65^\circ$$



Angle A.

$$180^\circ - 64^\circ - 31^\circ = 85^\circ$$

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

$$\frac{a}{\sin 85^\circ} = \frac{60.3}{\sin 64^\circ}$$

$$\frac{a \sin 64^\circ}{\sin 64^\circ} = \frac{60.3 \sin 85^\circ}{\sin 64^\circ}$$

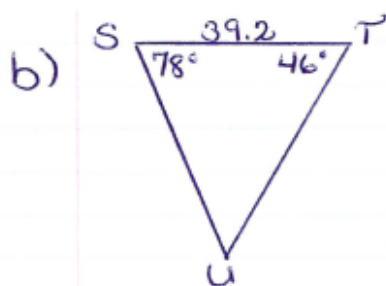
$$a = 66.8$$

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

$$\frac{b}{\sin 31^\circ} = \frac{60.3}{\sin 64^\circ}$$

$$\frac{b \sin 64^\circ}{\sin 64^\circ} = \frac{60.3 \sin 31^\circ}{\sin 64^\circ}$$

$$b = 34.6$$



Angle U

$$180^\circ - 78^\circ - 46^\circ = 56^\circ$$

$$\frac{s}{\sin S} = \frac{u}{\sin U}$$

$$\frac{s}{\sin 78^\circ} = \frac{39.2}{\sin 56^\circ}$$

$$\frac{s \sin 56^\circ}{\sin 56^\circ} = \frac{39.2 \sin 78^\circ}{\sin 56^\circ}$$

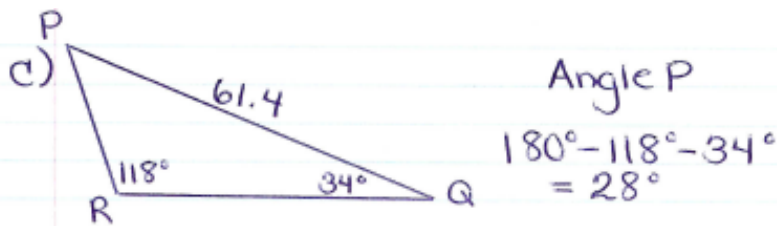
$$s = 46.3$$

$$\frac{t}{\sin T} = \frac{u}{\sin U}$$

$$\frac{t}{\sin 46^\circ} = \frac{39.2}{\sin 56^\circ}$$

$$\frac{t \sin 56^\circ}{\sin 56^\circ} = \frac{39.2 \sin 46^\circ}{\sin 56^\circ}$$

$$t = 34.0$$



$$\frac{p}{\sin P} = \frac{r}{\sin R}$$

$$\frac{p}{\sin 28^\circ} = \frac{61.4}{\sin 118^\circ}$$

$$\frac{p \sin 118^\circ}{\sin 118^\circ} = \frac{61.4 \sin 28^\circ}{\sin 118^\circ}$$

$$p = 32.7$$

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

$$\frac{q}{\sin 34^\circ} = \frac{61.4}{\sin 118^\circ}$$

$$\frac{q \sin 118^\circ}{\sin 118^\circ} = \frac{61.4 \sin 34^\circ}{\sin 118^\circ}$$

$$q = 38.9$$

4a) $\frac{a}{\sin A} = \frac{c}{\sin C}$

$$\frac{a}{\sin 31^\circ} = \frac{96.3}{\sin 81^\circ}$$

$$\frac{a \sin 81^\circ}{\sin 81^\circ} = \frac{96.3 \sin 31^\circ}{\sin 81^\circ}$$

$$a = 50.2$$

b) $\angle D = 180^\circ - 64^\circ - 46^\circ = 70^\circ$

c) First, you need to find $\angle R$:

$$\angle R = 180^\circ - 46^\circ - 26^\circ$$

$$\angle R = 108^\circ$$

To find p :

$$\frac{p}{\sin P} = \frac{r}{\sin R}$$

$$\frac{p}{\sin 46^\circ} = \frac{123}{\sin 108^\circ}$$

$$p \frac{\sin 108^\circ}{\sin 108^\circ} = \frac{123 \sin 46^\circ}{\sin 108^\circ}$$

$$p = 93.0$$

To find q :

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

$$\frac{q}{\sin 26^\circ} = \frac{123}{\sin 108^\circ}$$

$$q \frac{\sin 108^\circ}{\sin 108^\circ} = \frac{123 \sin 26^\circ}{\sin 108^\circ}$$

$$q = 56.7$$

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

$$\frac{q}{\sin 40^\circ} = \frac{25}{\sin 83^\circ}$$

$$q \frac{\sin 83^\circ}{\sin 83^\circ} = \frac{25 \sin 40^\circ}{\sin 83^\circ}$$

$$q = 16.2$$

6. Angle P:

$$\angle P = 180^\circ - 49^\circ - 45^\circ$$

$$\angle P = 86^\circ$$

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

$$\frac{q}{\sin 49^\circ} = \frac{24}{\sin 86^\circ}$$

$$\frac{q \sin 86^\circ}{\sin 86^\circ} = \frac{24 \sin 49^\circ}{\sin 86^\circ}$$

$$\frac{r}{\sin R} = \frac{p}{\sin P}$$

$$\frac{r}{\sin 45^\circ} = \frac{24}{\sin 86^\circ}$$

$$\frac{r \sin 86^\circ}{\sin 86^\circ} = \frac{24 \sin 45^\circ}{\sin 86^\circ}$$

$$q = 18.2$$

$$r = 17.0$$