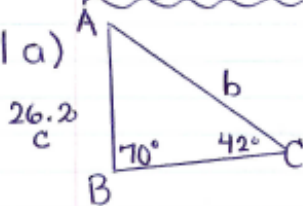


SOLUTIONS => LAW OF SINES WORKSHEET

1 a)



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

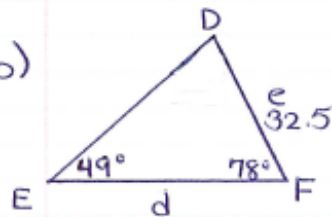
$$\frac{b}{\sin 70^\circ} = \frac{26.2}{\sin 42^\circ}$$

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

$$b = \frac{26.2 (0.9397)}{0.6691}$$

$$b = 36.8$$

b)



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

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

$$= 53^\circ$$

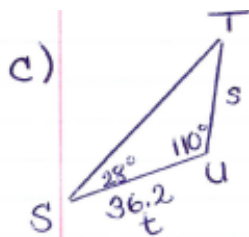
$$\frac{d}{\sin D} = \frac{e}{\sin E}$$

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

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

$$d = \frac{32.5 (0.7986)}{0.7547}$$

$$d = 34.4$$



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

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

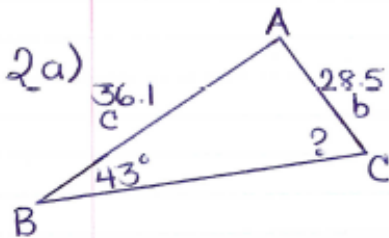
$$\frac{s}{\sin S} = \frac{t}{\sin T}$$

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

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

$$s = \frac{36.2(0.4695)}{0.6691}$$

$$s = 25.4$$



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

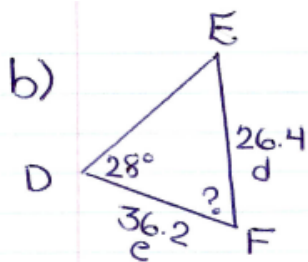
$$\frac{\sin 43^\circ}{28.5} = \frac{\sin C}{36.1}$$

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

$$0.8639 = \sin C$$

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

$$60^\circ = C$$



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

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

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

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

$$\sin E = \frac{36.2(0.4695)}{26.4}$$

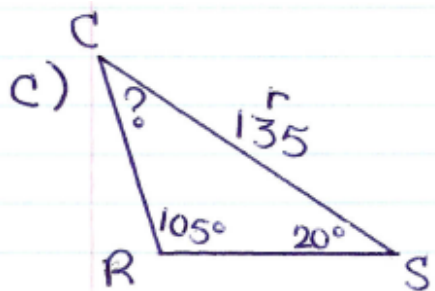
$$\sin E = 0.6437$$

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

$$E = 40^\circ$$

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

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



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

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



$$\sin P = \sin Q$$

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

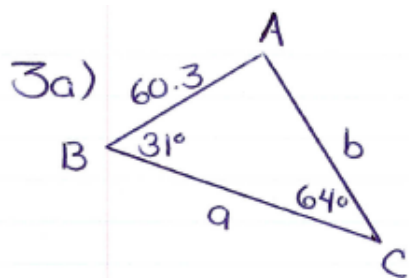
$$\frac{38.2 \sin P}{38.2} = \frac{60.3 \sin 35^\circ}{38.2}$$

$$\sin P = \frac{60.3(0.5736)}{38.2}$$

$$\sin P = 0.9054$$

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

$$P = 65^\circ$$



Angle A.

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

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

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

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

$$a = \frac{60.3(0.9962)}{0.8988}$$

$$a = 66.8$$

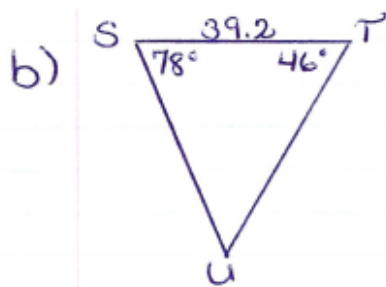
$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

$$b = \frac{60.3(0.5150)}{0.8988}$$

$$b = 34.6$$



Angle U

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

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

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

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

$$s = \frac{39.2(0.9781)}{0.8290}$$

$$s = 46.3$$

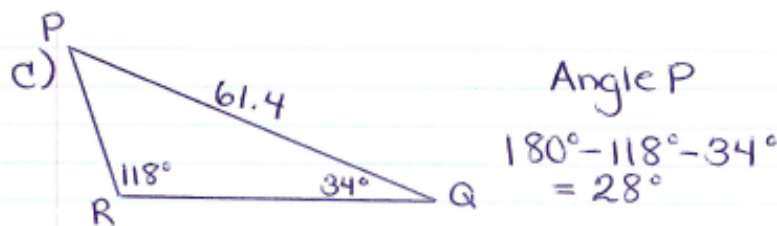
$$\frac{t}{\sin T} = \frac{u}{\sin U}$$

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

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

$$t = \frac{39.2(0.7193)}{0.8290}$$

$$t = 34.0$$



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

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

$$p \sin 118^\circ = 61.4 \sin 28^\circ$$

$$p = \frac{61.4 (0.4695)}{0.8829}$$

$$p = 32.7$$

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

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

$$q \sin 118^\circ = 61.4 \sin 34^\circ$$

$$q = \frac{61.4 (0.5592)}{0.8829}$$

$$q = 38.9$$

4a)

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

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

$$a \sin 81^\circ = 96.3 \sin 31^\circ$$

$$a = \frac{96.3 (0.5150)}{0.9877}$$

$$a = 50.2$$

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

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

$$\begin{aligned}\angle R &= 180^\circ - 46^\circ - 26^\circ \\ \angle R &= 108^\circ\end{aligned}$$

To find  $p$ :

$$\begin{aligned}\frac{p}{\sin P} &= \frac{r}{\sin R} \\ \frac{p}{\sin 46^\circ} &= \frac{123}{\sin 108^\circ} \\ p \frac{\sin 108^\circ}{\sin 108^\circ} &= \frac{123 \sin 46^\circ}{\sin 108^\circ} \\ p &= \frac{123(0.7193)}{0.9511} \\ p &= 93.0\end{aligned}$$

To find  $q$ :

$$\begin{aligned}\frac{q}{\sin Q} &= \frac{r}{\sin R} \\ \frac{q}{\sin 26^\circ} &= \frac{123}{\sin 108^\circ} \\ q \frac{\sin 108^\circ}{\sin 108^\circ} &= \frac{123 \sin 26^\circ}{\sin 108^\circ} \\ q &= \frac{123(0.4384)}{0.9511} \\ q &= 56.7\end{aligned}$$

5.

$$\begin{aligned}\frac{q}{\sin Q} &= \frac{r}{\sin R} \\ \frac{q}{\sin 40^\circ} &= \frac{25}{\sin 83^\circ} \\ q \frac{\sin 83^\circ}{\sin 83^\circ} &= \frac{25 \sin 40^\circ}{\sin 83^\circ} \\ q &= \frac{25(0.6428)}{0.9925} \\ q &= 16.2\end{aligned}$$



6. Angle P:

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

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

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

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

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

$$q = \frac{24(0.7547)}{0.9976}$$

$$q = 18.2$$

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

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

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

$$r = \frac{24(0.7071)}{0.9976}$$

$$r = 17.0$$