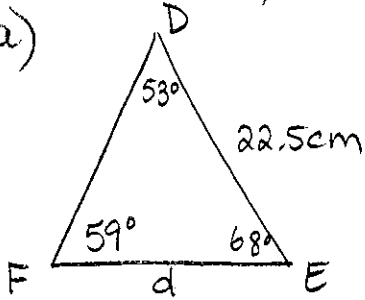


Foundations of Math II

3.2

P. 125 # 3-5, 7, 9, 10, 13 draw diagrams

3. a)



$$\angle F = 180^\circ - 53^\circ - 68^\circ = 59^\circ$$

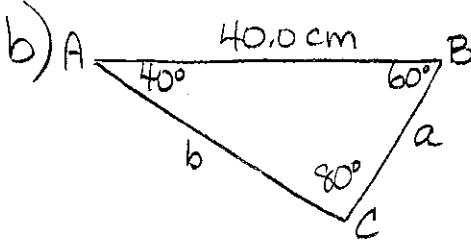
$$\frac{d}{\sin 53^\circ} = \frac{22.5}{\sin 59^\circ}$$

$$d = \frac{22.5 \sin 53^\circ}{\sin 59^\circ}$$

$$d = \frac{22.5(0.7986)}{0.8572}$$

$$d = 20.96$$

$$d = 21.0 \text{ cm}$$



$$\angle C = 180^\circ - 40^\circ - 60^\circ = 80^\circ$$

$$\frac{a}{\sin 40^\circ} = \frac{40}{\sin 80^\circ}$$

$$a = \frac{40 \sin 40^\circ}{\sin 80^\circ}$$

$$a = \frac{40(0.6428)}{0.9848}$$

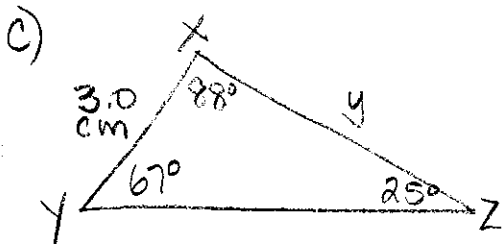
$$a = 26.1 \text{ cm}$$

$$\frac{b}{\sin 60^\circ} = \frac{40}{\sin 80^\circ}$$

$$b = \frac{40 \sin 60^\circ}{\sin 80^\circ}$$

$$b = \frac{40(0.8660)}{0.9848}$$

$$b = 35.2 \text{ cm}$$



$$\begin{aligned} \angle Y &= 180^\circ - 88^\circ - 25^\circ \\ &= 67^\circ \end{aligned}$$

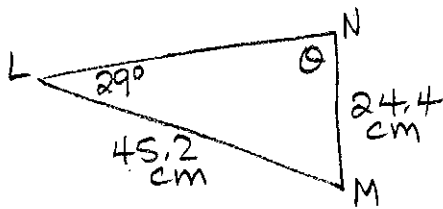
$$\frac{y}{\sin 67^\circ} = \frac{3.0}{\sin 25^\circ}$$

$$y = \frac{3 \sin 67^\circ}{\sin 25^\circ}$$

$$y = \frac{3(0.9205)}{0.4226}$$

$$y = 6.5 \text{ cm}$$

3. d) P. 125 cont.



Use \sin^{-1} \rightarrow

$$\frac{\sin \theta}{45.2} = \frac{\sin 29^\circ}{24.4}$$

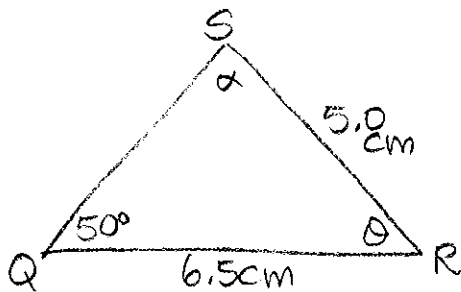
$$\sin \theta = \frac{45.2 (\sin 29^\circ)}{24.4}$$

$$\sin \theta = \frac{45.2 (0.4848)}{24.4}$$

$$\sin \theta = 0.8981$$

$$\theta = 64^\circ$$

e)



$$\frac{\sin \alpha}{6.5} = \frac{\sin 50^\circ}{5.0}$$

$$\sin \alpha = \frac{6.5 \sin 50^\circ}{5}$$

$$\sin \alpha = \frac{6.5 (0.7660)}{5}$$

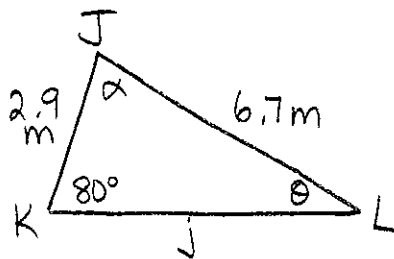
$$\sin \alpha = 0.9958$$

$$\alpha = 85^\circ$$

$$\theta = 180^\circ - 50^\circ - 85^\circ$$

$$\theta = 45^\circ$$

f)



$$\frac{\sin \theta}{2.9} = \frac{\sin 80^\circ}{6.7}$$

$$\sin \theta = \frac{2.9 \sin 80^\circ}{6.7}$$

$$\sin \theta = \frac{2.9 (0.9848)}{6.7}$$

$$\sin \theta = 0.4263$$

$$\theta = 25^\circ$$

$$\alpha = 180^\circ - 80^\circ - 25^\circ = 75^\circ$$

$$\frac{j}{\sin 75^\circ} = \frac{6.7}{\sin 80^\circ}$$

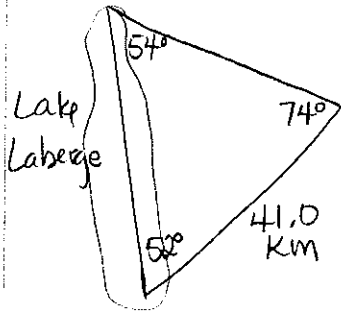
$$j = \frac{6.7 \sin 75^\circ}{\sin 80^\circ}$$

$$j = \frac{6.7 (0.9659)}{0.9848}$$

$$j = 6.6 \text{ m}$$

p.125 cont.

4.



$$3^{\text{rd}} \text{ angle} = 180^\circ - 74^\circ - 52^\circ = 54^\circ$$

a) In a triangle, the longest side is opposite the largest angle so the lake must be longer than 41 km because it is across from the largest angle.

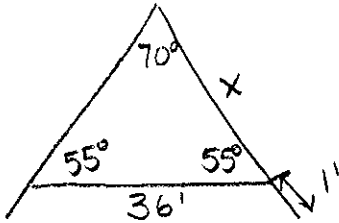
$$b) \frac{\text{lake}}{\sin 74^\circ} = \frac{41.0}{\sin 54^\circ}$$

$$\text{lake} = \frac{41 \sin 74^\circ}{\sin 54^\circ}$$

$$\text{lake} = \frac{41(0.9613)}{0.8090}$$

$$\text{lake} = 48.7 \text{ km}$$

5.



This is an isosceles triangle so the bottom two angles are the same:

$$\frac{180^\circ - 70^\circ}{2} = \frac{110^\circ}{2} = 55^\circ$$

$$\frac{x}{\sin 55^\circ} = \frac{36}{\sin 70^\circ}$$

$$x = \frac{36 \sin 55^\circ}{\sin 70^\circ}$$

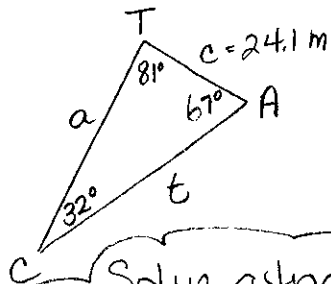
$$x = \frac{36(0.8192)}{0.9397}$$

$$x = 31.38$$

$$\begin{aligned} \text{rafter} &= 31.38 \text{ ft} \\ &= 31' 5'' + 1'' \\ &= 32' 5'' \end{aligned}$$

$$0.38 \text{ ft} = 4.56 \text{ in}$$

7. P. 125 cont.



Solve a triangle means find all side lengths and all angle measurements

$$\angle A = 180^\circ - 32^\circ - 81^\circ = 67^\circ$$

$$\frac{t}{\sin 81^\circ} = \frac{24.1}{\sin 32^\circ}$$

$$t = \frac{24.1 \sin 81^\circ}{\sin 32^\circ}$$

$$t = \frac{24.1 (0.9877)}{0.5299}$$

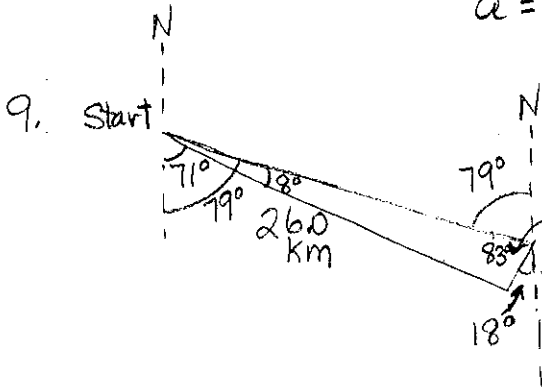
$$t = 44.9 \text{ m}$$

$$\frac{a}{\sin 67^\circ} = \frac{24.1}{\sin 32^\circ}$$

$$a = \frac{24.1 \sin 67^\circ}{\sin 32^\circ}$$

$$a = \frac{24.1 (0.9205)}{0.5299}$$

$$a = 42.9 \text{ m}$$



$$180^\circ - 79^\circ - 18^\circ = 83^\circ$$

side "d" is the distance remaining

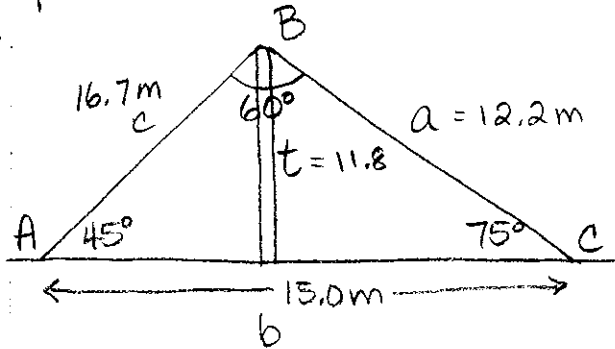
$$\frac{d}{\sin 8^\circ} = \frac{26.0}{\sin 83^\circ}$$

$$d = \frac{26 \sin 8^\circ}{\sin 83^\circ}$$

$$d = \frac{26 (0.1392)}{0.9925}$$

$$d = 3.6 \text{ km}$$

10. P. 125 cont.



$$\angle C = 180^\circ - 60^\circ - 45^\circ = 75^\circ$$

$$\frac{a}{\sin 45^\circ} = \frac{15}{\sin 60^\circ}$$

$$a = \frac{15 \sin 45^\circ}{\sin 60^\circ}$$

$$a = \frac{15(0.7071)}{0.8660}$$

$$a = 12.2 \text{ m}$$

$$\frac{c}{\sin 75^\circ} = \frac{15}{\sin 60^\circ}$$

$$c = \frac{15 \sin 75^\circ}{\sin 60^\circ}$$

$$c = \frac{15(0.9659)}{0.8660}$$

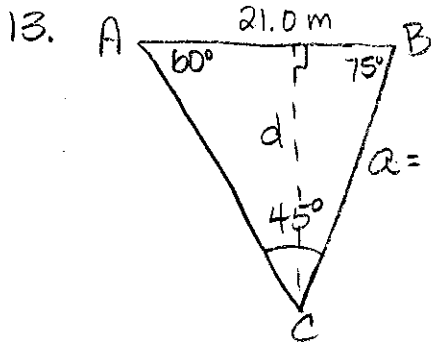
$$c = 16.7 \text{ m}$$

$$\sin 75^\circ = \frac{t}{12.2}$$

$$12.2 \sin 75^\circ = t$$

$$12.2(0.9659) = t$$

$$11.8 = t$$



$$\angle C = 180^\circ - 60^\circ - 75^\circ = 45^\circ$$

$$\frac{a}{\sin 60^\circ} = \frac{21.0}{\sin 45^\circ}$$

$$a = \frac{21 \sin 60^\circ}{\sin 45^\circ}$$

$$a = \frac{21(0.8660)}{0.7071}$$

$$a = 25.7 \text{ m}$$

$$\sin 75^\circ = \frac{d}{25.7}$$

$$25.7 \sin 75^\circ = d$$

$$25.7(0.9659) = d$$

$$24.8 \text{ m}$$

The gorge is 24.8 m deep