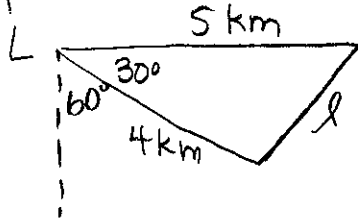


3.4

Foundations of Math II

p. 147 #3-9 draw diagrams

3.



a) use the cosine law

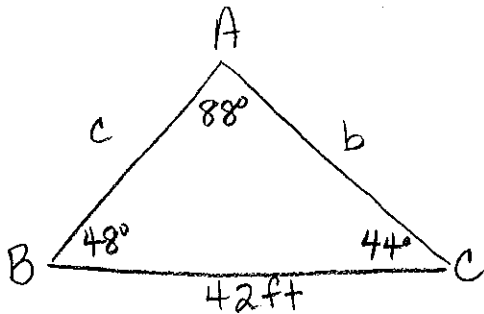
$$b) l^2 = 5^2 + 4^2 - 2(5)(4)\cos 30^\circ$$

$$l^2 = 25 + 16 - 34.6410$$

$$l^2 = 6.359$$

$$l = 2.5 \text{ km apart}$$

4.



The two rafters are different lengths because they are opposite different angles.

$$\angle A = 180^\circ - 48^\circ - 44^\circ = 88^\circ$$

$$\frac{42}{\sin 88^\circ} = \frac{b}{\sin 48^\circ}$$

$$\frac{42 \sin 48^\circ}{\sin 88^\circ} = b$$

$$\frac{42(0.74314)}{(0.99939)} = b$$

$$31.2 = b$$

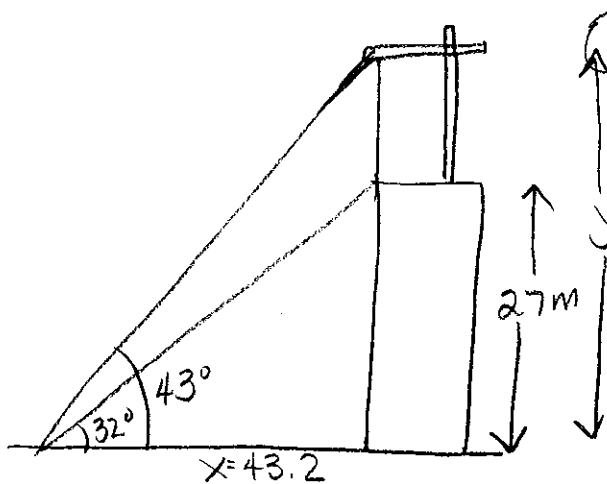
$$\frac{42}{\sin 88^\circ} = \frac{c}{\sin 44^\circ}$$

$$\frac{42 \sin 44^\circ}{\sin 88^\circ} = c$$

$$\frac{42(0.69466)}{0.99939} = c$$

$$29.2 = c$$

5.



$$\textcircled{1} \tan 32^\circ = \frac{27}{x}$$

$$x \tan 32^\circ = 27$$

$$x = \frac{27}{\tan 32^\circ}$$

$$x = \frac{27}{0.62487}$$

$$x = 43.2 \text{ m}$$

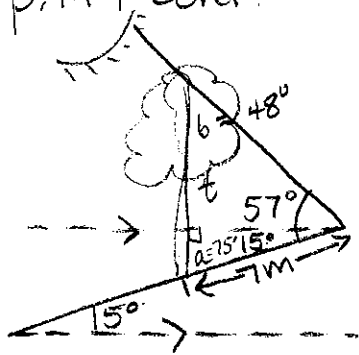
$$\textcircled{2} \tan 43^\circ = \frac{y}{43.2}$$

$$43.2(0.932515) = y$$

$$40.2 = y$$

$$\textcircled{3} \text{ crane} = 40.2 - 27 = 13.2 \text{ m}$$

6. p. 147 cont.



a) $L_a = 180^\circ - 90^\circ - 15^\circ = 75^\circ$
 $L_b = 180^\circ - 57^\circ - 75^\circ = 48^\circ$

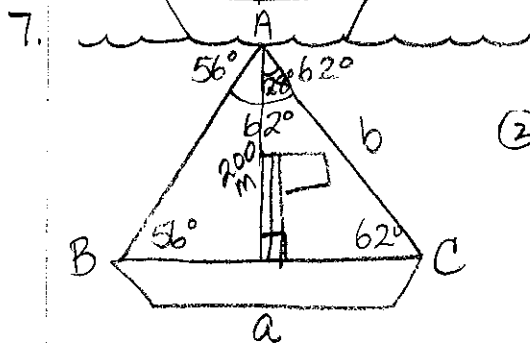
use sine law.

b) $\frac{t}{\sin 57^\circ} = \frac{7}{\sin 48^\circ}$

$$t = \frac{7 \sin 57^\circ}{\sin 48^\circ}$$

$$t = \frac{7(0.83867)}{0.74314}$$

$$t = 7.9 \text{ m}$$



① $L_A = 180^\circ - 56^\circ - 62^\circ = 62^\circ$

② find distance b first:

$$\cos 28^\circ = \frac{200}{b}$$

$$b \cos 28^\circ = 200$$

$$b = \frac{200}{\cos 28^\circ}$$

$$b = \frac{200}{0.8829}$$

$$b = 226.5$$

③ $L_C = 180^\circ - 90^\circ - 28^\circ = 62^\circ$

④ $L_B = 180^\circ - 62^\circ - 62^\circ = 56^\circ$

⑤ $\frac{226.5}{\sin 56^\circ} = \frac{a}{\sin 62^\circ}$

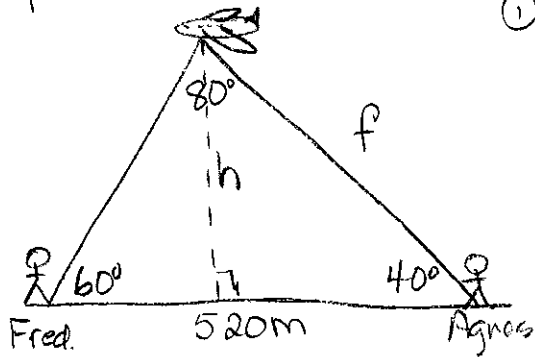
$$\frac{226.5 \sin 62^\circ}{\sin 56^\circ} = a$$

$$\frac{226.5(0.8829)}{0.8290} = a$$

$$241.2 \text{ m} = a$$

The sunken ship is about 241.2 m long

8. p. 147 cont.



① angle at Brendan = $180^\circ - 60^\circ - 40^\circ = 80^\circ$

② find the length of f

$$\frac{f}{\sin 60^\circ} = \frac{520}{\sin 80^\circ}$$

$$f = \frac{520 \sin 60^\circ}{\sin 80^\circ}$$

$$f = \frac{520 (0.8660)}{0.9848}$$

$$f = 457.2705$$

③ find height h

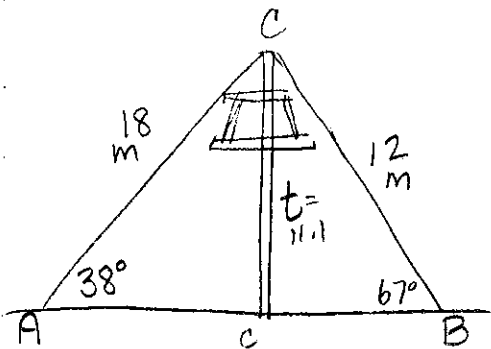
$$\sin 40^\circ = \frac{h}{457.2705}$$

$$457.2705 \sin 40^\circ = h$$

$$457.2705 (0.6428) = h$$

$$293.9 \text{ m} = h$$

9.



a) $\sin 38^\circ = \frac{t}{18}$

$$18 \sin 38^\circ = t$$

$$18 (0.61566) = t$$

$$11.0819 = t$$

$$11.1 = t$$

b) ① $\sin B = \frac{11.0819}{12}$

$$\sin B = 0.9235$$

$$\angle B = 67^\circ$$

② $\angle C = 180^\circ - 38^\circ - 67^\circ = 75^\circ$

③ $c^2 = 18^2 + 12^2 - 2(18)(12) \cos 75^\circ$

$$c^2 = 324 + 144 - 111.8098$$

$$c^2 = 356.1902$$

$$c = 18.873$$

$$c = 18.9 \text{ m}$$