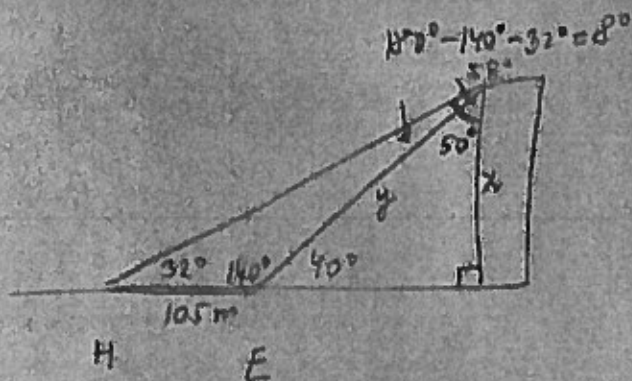


P 14 #4



• Find "y":

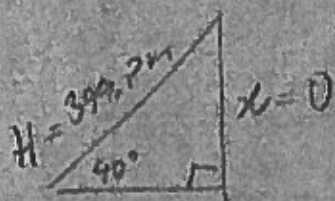


$$\frac{y}{\sin 32^\circ} = \frac{105}{\sin 8^\circ}$$

$$y = \frac{(105)(\sin 32^\circ)}{\sin 8^\circ}$$

$$y = 399.8 \text{ m}$$

• Find "x":



$$\sin \theta = \frac{o}{h}$$

$$\sin 40^\circ = \frac{x}{399.8}$$

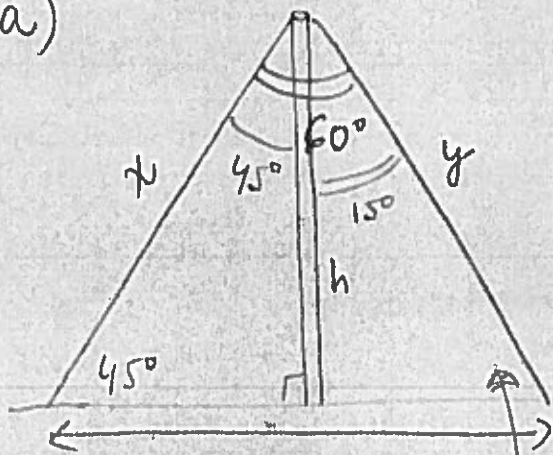
$$x = (399.8)(\sin 40^\circ)$$

$$x = 256.927 \dots \text{ m}$$

∴ The height of the building is 256.99m.

φ 15 #5

a)



$$\frac{y}{\sin 45^\circ} = \frac{15.0}{\sin 60^\circ}$$

$$y = \frac{(15.0)(\sin 45^\circ)}{\sin 60^\circ}$$

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

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

$$= \frac{15.0}{\sin 60^\circ}$$

$$= \frac{(15.0)(\sin 75^\circ)}{\sin 60^\circ}$$

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

are 12.2 m and 16.7 m.

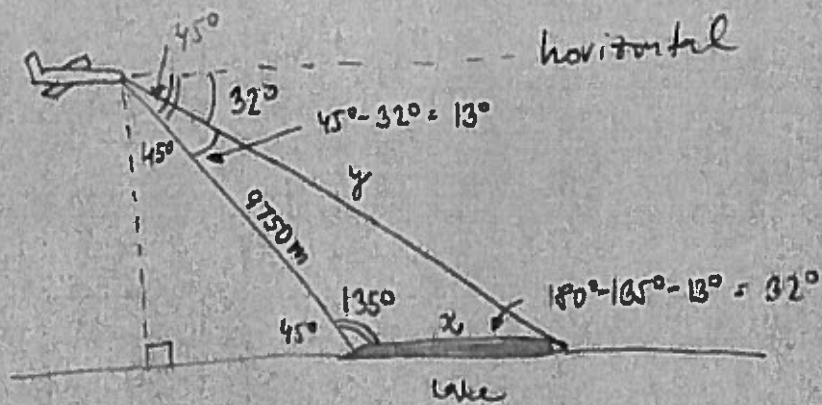
$$45^\circ = \frac{x}{16.7}$$

$$x = (16.7)(\sin 45^\circ)$$

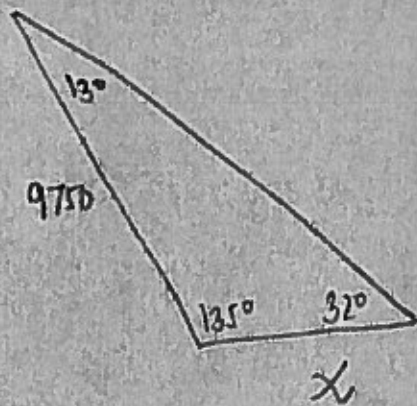
$$x = 11.8 \text{ m}$$

is 11.8 m tall.

p 15 #6



• Find 'x':



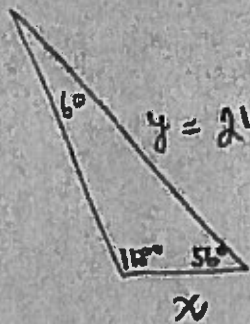
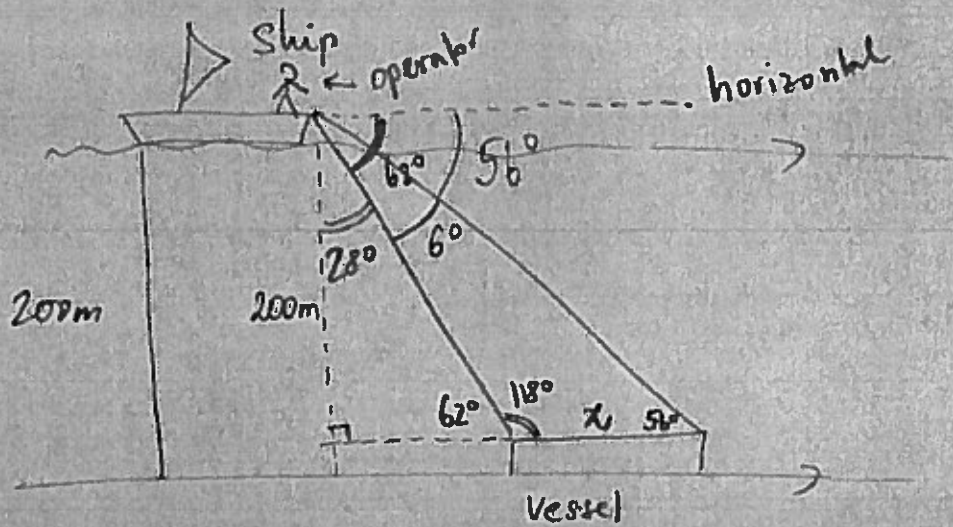
$$\frac{x}{\sin 13^\circ} = \frac{9750}{\sin 32^\circ}$$

$$x = \frac{(9750)(\sin 13^\circ)}{\sin 32^\circ}$$

$$x = 4139 \text{ m}$$

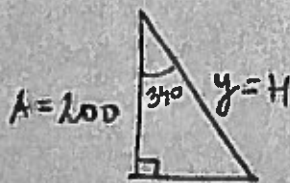
∴ The width of the lake is 4139 m.

P 15 #7



$$y = 241.24$$

• Find "y" from a right-angled Δ



$$A = 200$$

$$y = H$$

$$\cos \theta = \frac{A}{H}$$

$$\cos 34^\circ = \frac{200}{y}$$

$$y = \frac{200}{\cos 34^\circ}$$

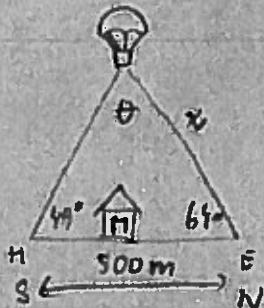
$$\textcircled{*} \underline{y = 241.24m}$$

• Find "x"

$$\frac{x}{\sin 6^\circ} = \frac{241.24}{\sin 118^\circ}$$

$$\underline{\underline{x = 28.6m}}$$

8. A hot air balloon is flying above the mall. Elli is standing due north of the mall and can see the balloon at an angle of inclination of 64° . Helmut is due south of the mall and can see the balloon at an angle of inclination of 49° . The horizontal distance between Helmut and Elli is 500m. Determine the distance that the hot air balloon is from Elli.



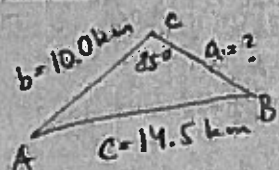
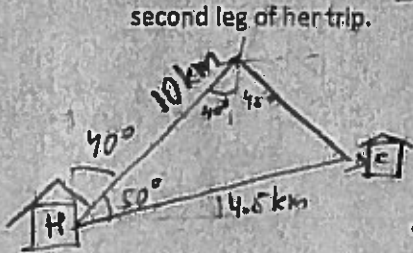
$$\frac{x}{\sin 49^\circ} = \frac{500}{\sin 67^\circ}$$

$$x = 410\text{m}$$

$$\angle \theta = 180^\circ - 49^\circ - 64^\circ = 67^\circ$$

\therefore The hot air balloon is 410m away from Elli.

9. Elli decided to ski to a friend's cabin. She skied 10.0km in the direction $N40^\circ E$. She rested, then skied $S45^\circ E$ and arrived at the cabin. The cabin is 14.5km from her home, as the crow flies. Determine, to the nearest tenth of a kilometer, the distance she travelled on the second leg of her trip.



$$\sin B = \frac{(10.0)(\sin 40^\circ)}{14.5}$$

$$B = \sin^{-1}(0.68703)$$

$$\angle B = 43^\circ$$

$$\angle A = 180^\circ - 85^\circ - 43^\circ = 52^\circ$$

$$\frac{a}{\sin 52^\circ} = \frac{14.5}{\sin 85^\circ}$$

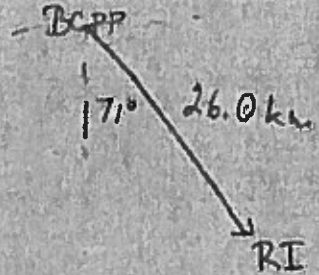
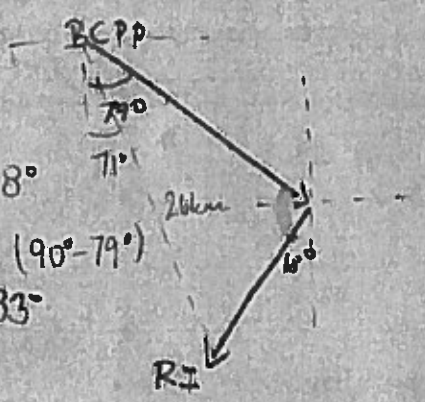
$$\therefore a = 11.5 \text{ km}$$

distance on the second leg of her trip

- distance travelled
- $a + b = 21.5$
- $\frac{\sin B}{b} = \frac{\sin C}{c}$

$$11.5 + 10 = 21.5 \text{ km}$$

10. Elli is sailing from Bear Greek Provincial Park on Okanagan Lake to Rattlesnake Island. She had planned to sail 26.0km in the direction $S71^\circ E$; however, the wind and current pushed her off course. After several hours, she discovered that she had actually been sailing $S79^\circ E$. She checked her map and saw that she must sail $S18^\circ W$ to reach Rattlesnake Island. Determine, to the nearest tenth of a kilometer, the distance remaining to Rattlesnake Island.



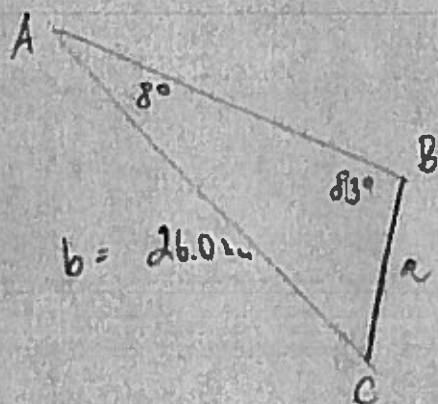
$$79^\circ - 71^\circ = 8^\circ$$

$$(90^\circ - 18^\circ) + (90^\circ - 79^\circ) = 83^\circ$$

8/26/20

P 16

10



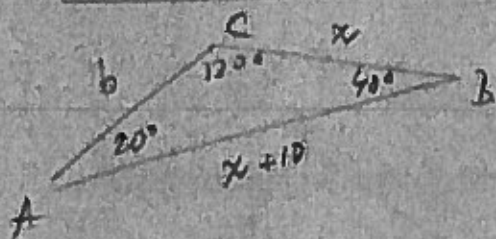
$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$a = \frac{(\sin 8^\circ)(26.0)}{\sin 83^\circ}$$

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

\therefore Elli has 3.6 km to sail before reaching Rattle snake Island.

11. The interior angles of a triangle measure 120° , 40° , and 20° . The longest side of the triangle is 10cm longer than the shortest side. Determine the perimeter of the triangle, to the nearest centimeter.



$$\frac{(x+10)}{\sin 120^\circ} = \frac{x}{\sin 20^\circ}$$

$$0.3720(x+10) = 0.0660x$$

$$\begin{array}{r} 0.3720x + 3.720 = 0.0660x \\ -0.3420x \qquad \qquad -0.3420x \end{array}$$

$$\frac{2.420}{0.5240} = \frac{0.5240x}{0.5240}$$

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

- $a = 6.5 \text{ cm}$
- $c = 16.5 \text{ cm}$

$$\frac{b}{\sin 40^\circ} = \frac{6.5}{\sin 20^\circ}$$

$$b = \frac{(\sin 40^\circ)(6.5)}{\sin 20^\circ}$$

$$\underline{b = 12.2 \text{ cm}}$$

$$P = a + b + c$$

$$P = 6.5 + 16.5 + 12.2$$

$$\boxed{\therefore P = 35 \text{ cm}}$$