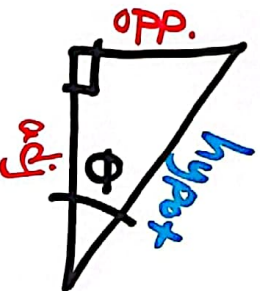


Trig Session #4: Applications

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$



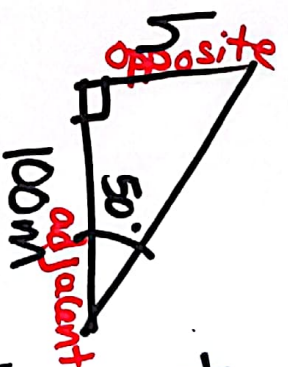
$$\tan A = \frac{75}{30}$$

$$\angle A = \tan^{-1}\left(\frac{75}{30}\right)$$

$$\angle A = \underline{\underline{68^\circ}}$$

$$\tan A = \frac{5}{3}$$

$$\angle A = \tan^{-1}\left(\frac{5}{3}\right) = \underline{\underline{59^\circ}}$$

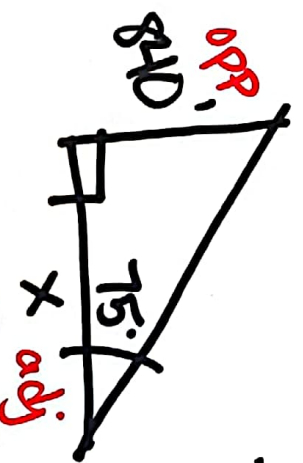


$$\tan 50^\circ = \frac{h}{100\text{m}}$$

$$h = 100\text{m} (\tan 50^\circ)$$

Use trig to find
height

$$\underline{\underline{h = 119\text{m}}}$$



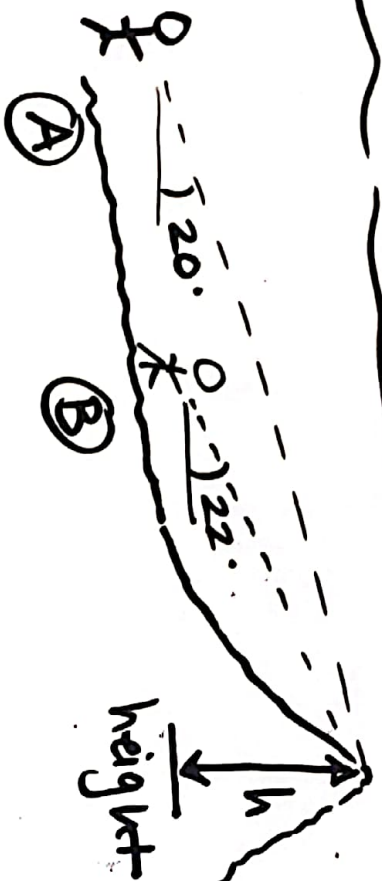
$$\tan 75^\circ = \frac{840'}{x}$$

$$x = \frac{840'}{\tan 75^\circ}$$

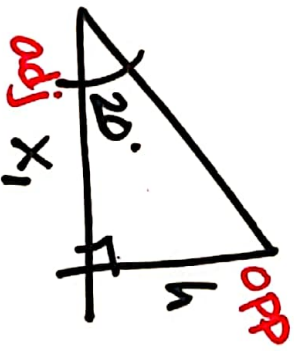
Use trig to find
distance

$$\underline{\underline{x = 225'}}$$

We use trig to find distance:



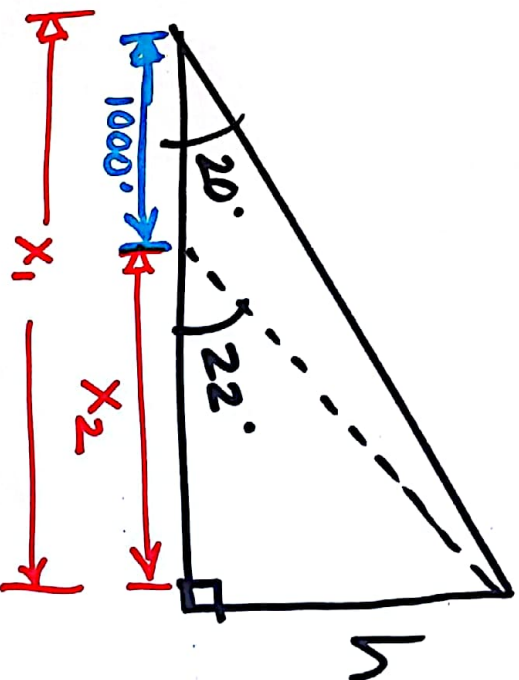
walk towards mountain
(1000 ft) + $x = 22^\circ$



$$\tan 20^\circ = \frac{h}{x_1}$$



$$\tan 22^\circ = \frac{h}{x_2}$$



$$x_1 = x_2 + 1000'$$

$$\tan 20^\circ = \frac{h}{x_2 + 1000'}$$

$$\begin{aligned} \tan 22^\circ &= 0.4040 \\ \tan 20^\circ &= 0.36397 \end{aligned}$$

$$\textcircled{1} \tan 20^\circ = \frac{h}{x_2 + 1000'}$$

$$\textcircled{2} \tan 22^\circ = \frac{h}{x_2}$$

$$\textcircled{1} 0.36397 = \frac{h}{x_2 + 1000'}$$

$$\textcircled{2} 0.4040 = \frac{h}{x_2}$$

~~$$\text{solve for } x_2 + 0.36397(x_2 + 1000') = h = 0.4040 x_2$$~~

~~$$\begin{aligned} & 0.36397 x_2 + 363.97 = h \\ & - 0.4040 x_2 \end{aligned}$$~~

$$= -h$$

$$-0.04003 x_2 + 363.97 = 0$$

$$\rightarrow x_2 = \frac{363.97}{+0.04003} = \underline{\underline{9087'}}$$

$$X_1 = X_2 + 1000'$$

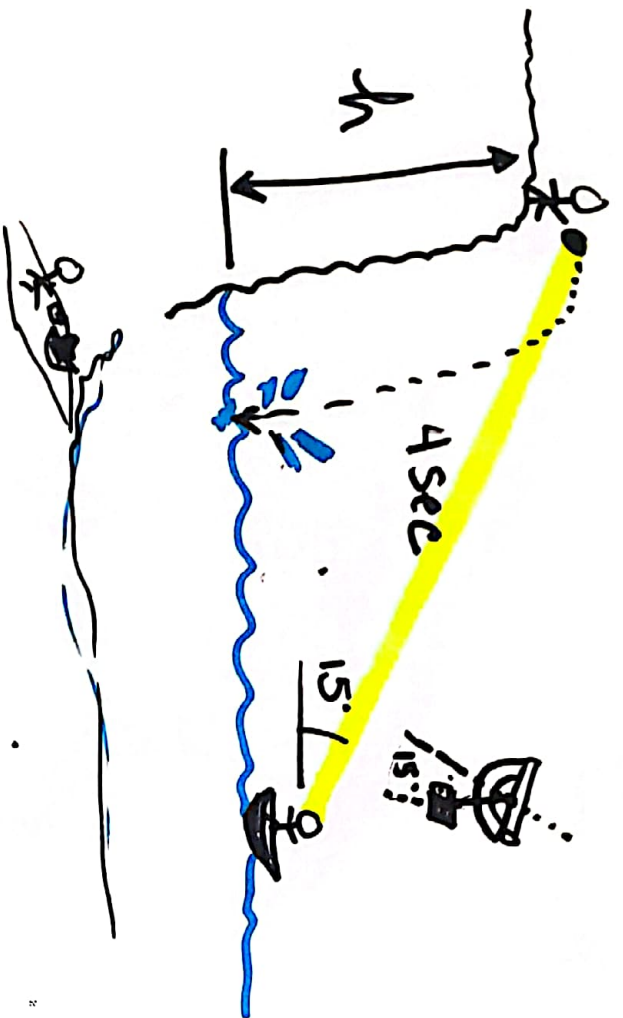
$$X_1 = 9087' + 1000' = \underline{\underline{10,087'}}$$

To get h:

$$\frac{h}{X_2} = 0.4040$$

$$h = X_2 (0.4040) = 9087' (0.4040)$$

$$h = 3,671'$$



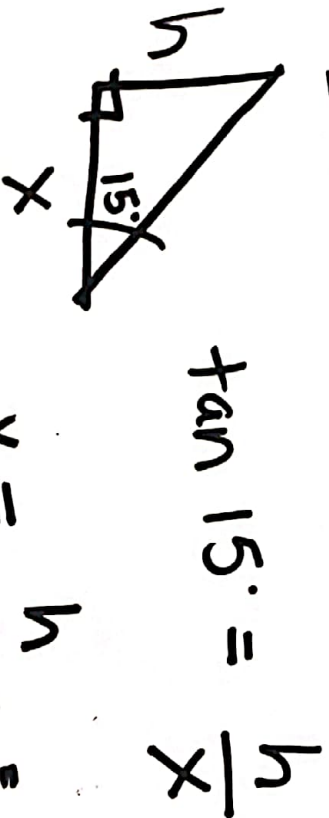
Part 1: How high is the cliff?

$$h = \frac{1}{2} g t^2$$

$$h = \frac{1}{2} (9.81 \frac{m}{s^2}) (4s)^2$$

$$\underline{\underline{h = 78.5 m}}$$

Part 2: Find dist. to boat



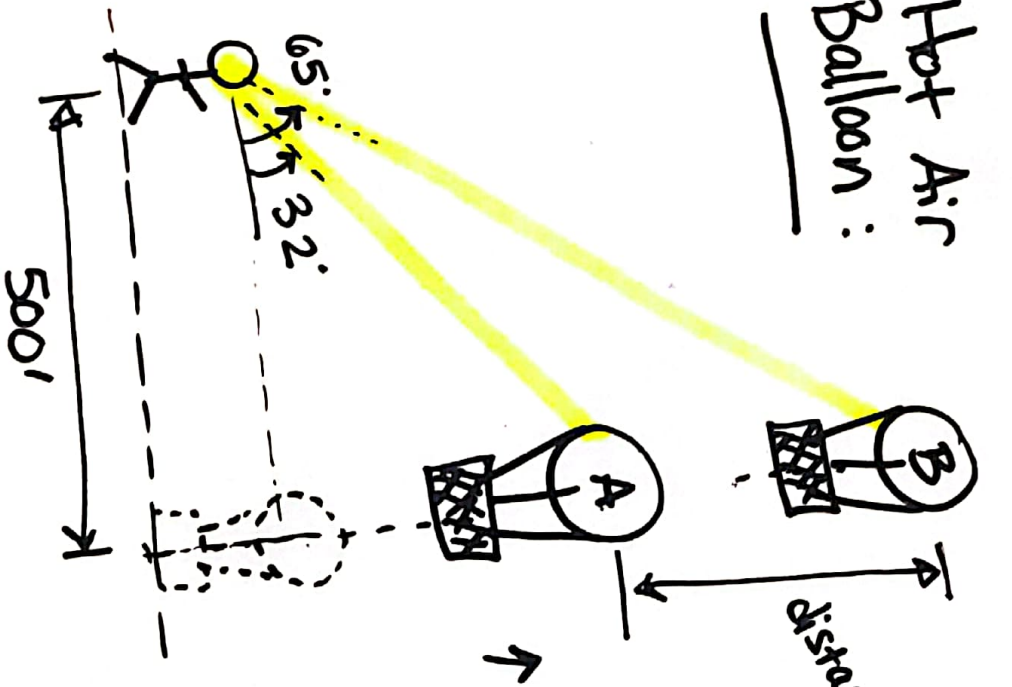
$$\tan 15^\circ = \frac{h}{x}$$

$$x = \frac{h}{\tan 15^\circ}$$

$$\frac{78.5 m}{\tan 15^\circ} = \underline{\underline{293 m}}$$

0.267949

Hot Air Balloon:

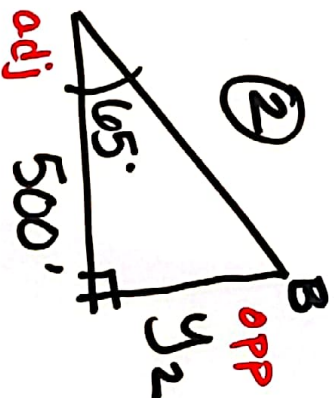
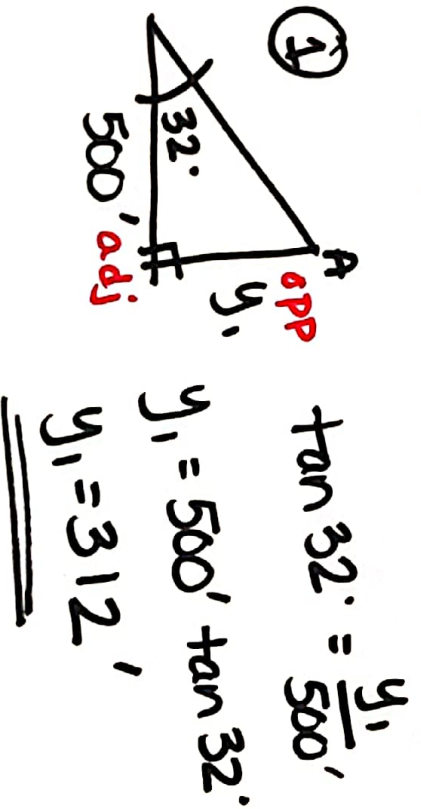


distance traveled is

After 5 seconds,
A = 65' at position B

What is the average
Speed of ascent?

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$



③

$$V = \frac{d}{t} = \frac{y_2 - y_1}{t}$$

$$V = \frac{1072' - 312'}{5 \text{ sec}}$$

$$V = 152 \frac{\text{ft}}{\text{sec}}$$

$$\tan 65^\circ = \frac{y_2}{500'}$$

$$y_2 = 500' \tan 65^\circ$$

$$y_2 = 1,072'$$