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Where Minds Pollinate

Class 12
Mathematics

Chapter 9
Exercise 9.3
Handwritten Solution

Follow Our Socials



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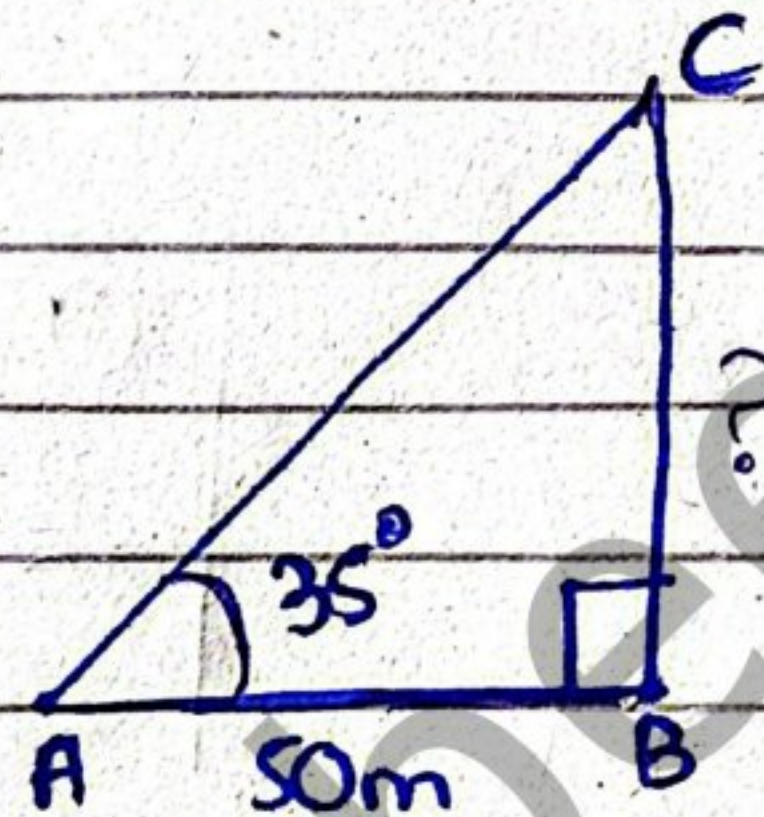
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$$= 11 \text{ sq unit}$$

$$\text{Area of quadrilateral} = 8 + 11 = 19 \text{ sq unit}$$

Exercise 9.3

Q1) Solution:-



Base = 50m

let height $BC = h = \text{Perp} ?$

$$\angle A = 35^\circ$$

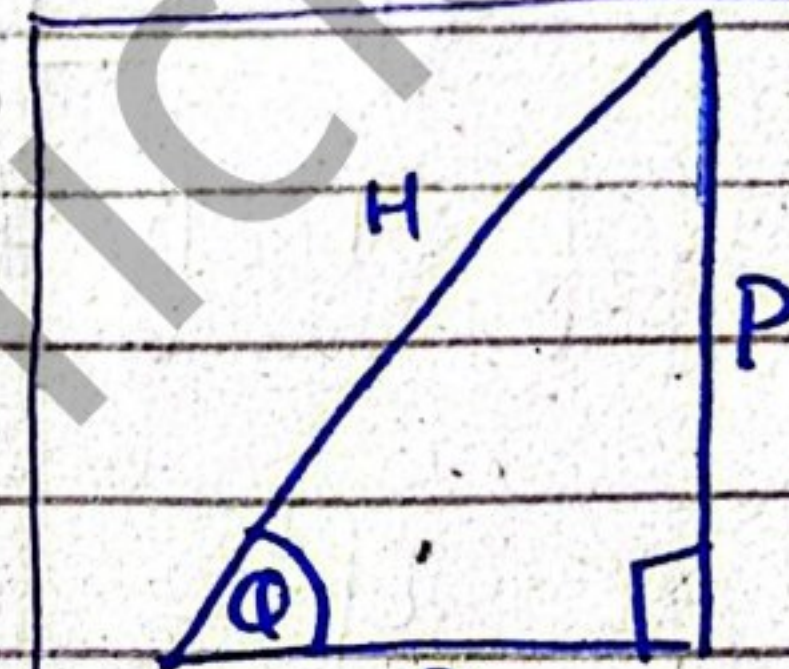
$$\text{As } \tan \theta = \frac{\text{Perp}}{\text{Base}}$$

$$\tan 35^\circ = \frac{h}{50} \Rightarrow$$

$$\boxed{h = 35\text{m}}$$

so height of building is 35m.

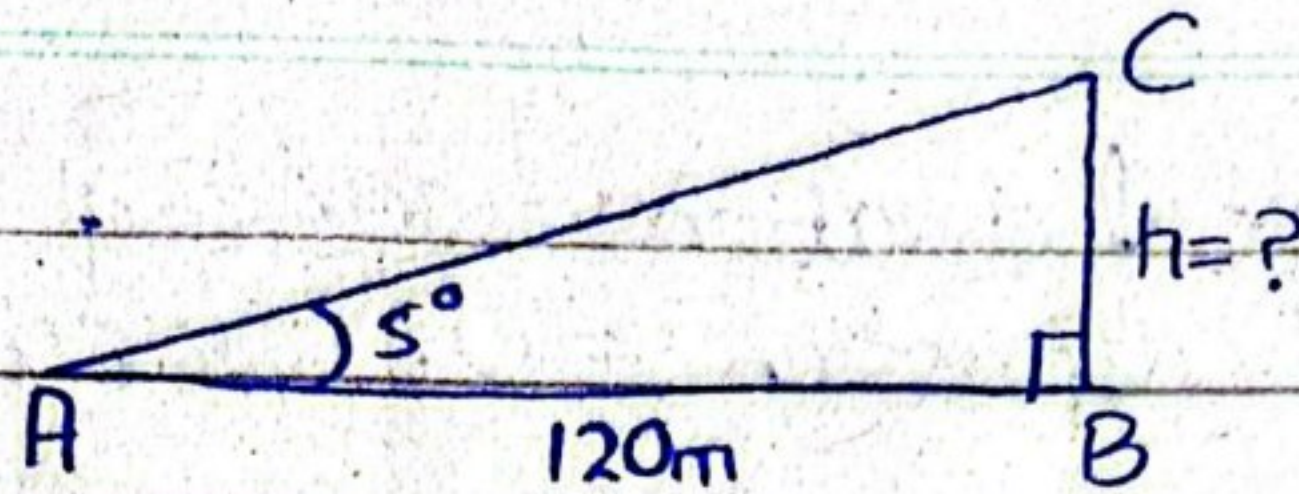
Answer.



$$H^2 = B^2 + P^2$$

$\tan^{-1}$ also called
Arc tan

Q2) Solution:-

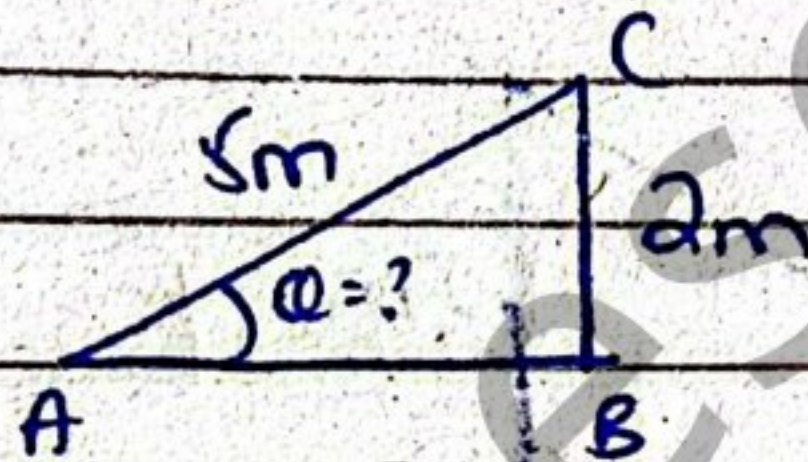


As $\cos \theta = \frac{\text{Base}}{\text{Hyp}}$

$$\cos 5^\circ = \frac{120}{H} \Rightarrow H = \frac{120}{\cos(5)} \Rightarrow \boxed{120.45 \text{ m}}$$

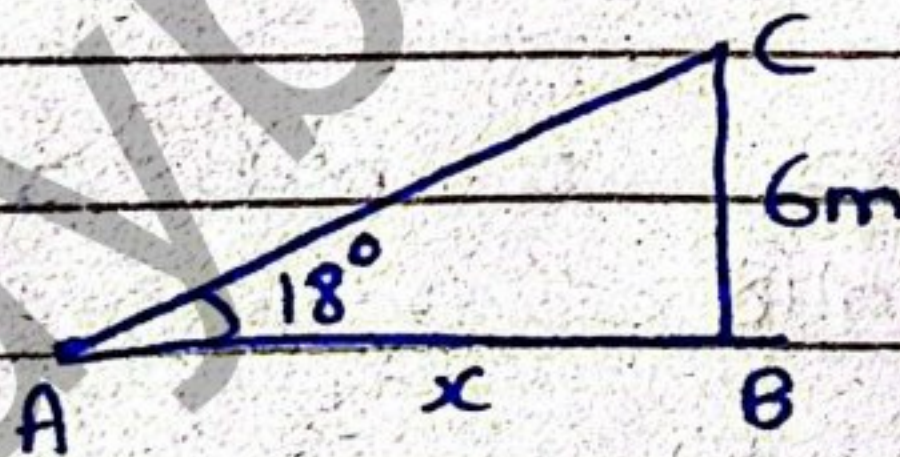
Now $\sin \theta = \frac{\text{Perp}}{\text{Hyp}} \rightarrow \sin 5^\circ = \frac{h}{120.45} \rightarrow h = 120.45 \sin 5^\circ$
 $\boxed{h = 10.49 \text{ m}}$

Q3) Solution:-



$$\sin \theta = \frac{2}{5} \Rightarrow \theta = \sin^{-1}(0.4) \Rightarrow \boxed{\theta = 23.5^\circ}$$

Q4)

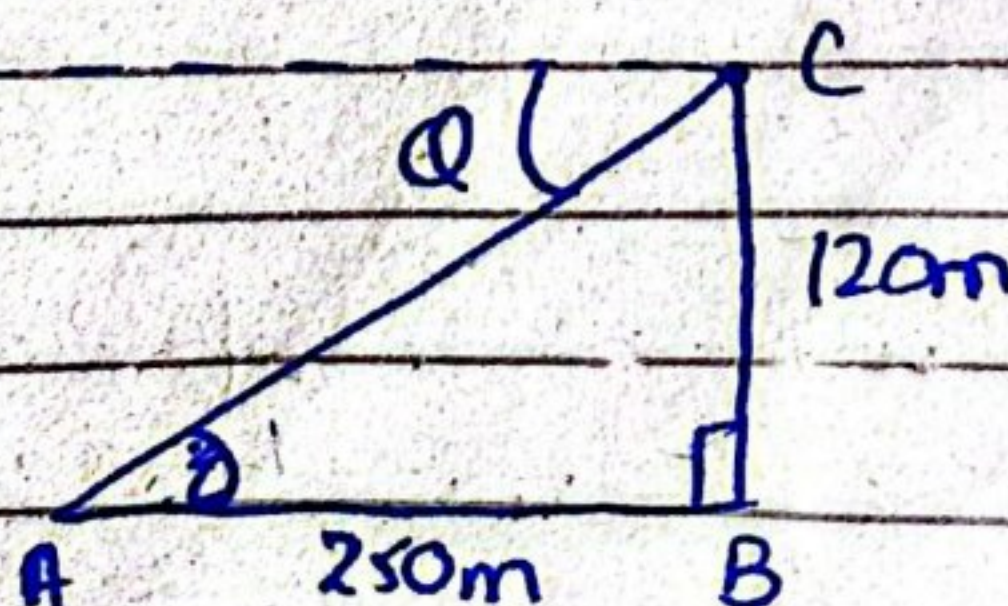


$$\tan \theta = \frac{P}{B}$$

$$\tan 18^\circ = \frac{6}{x}$$

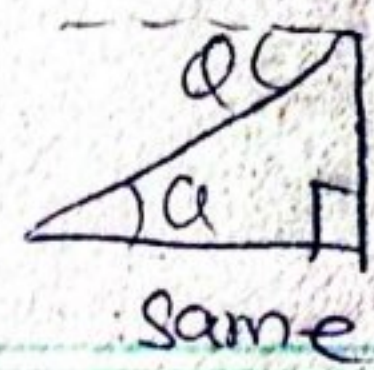
$$x = \frac{6}{\tan 18^\circ} \Rightarrow \boxed{x = 18.46 \text{ m}}$$

Q5) Solution:-



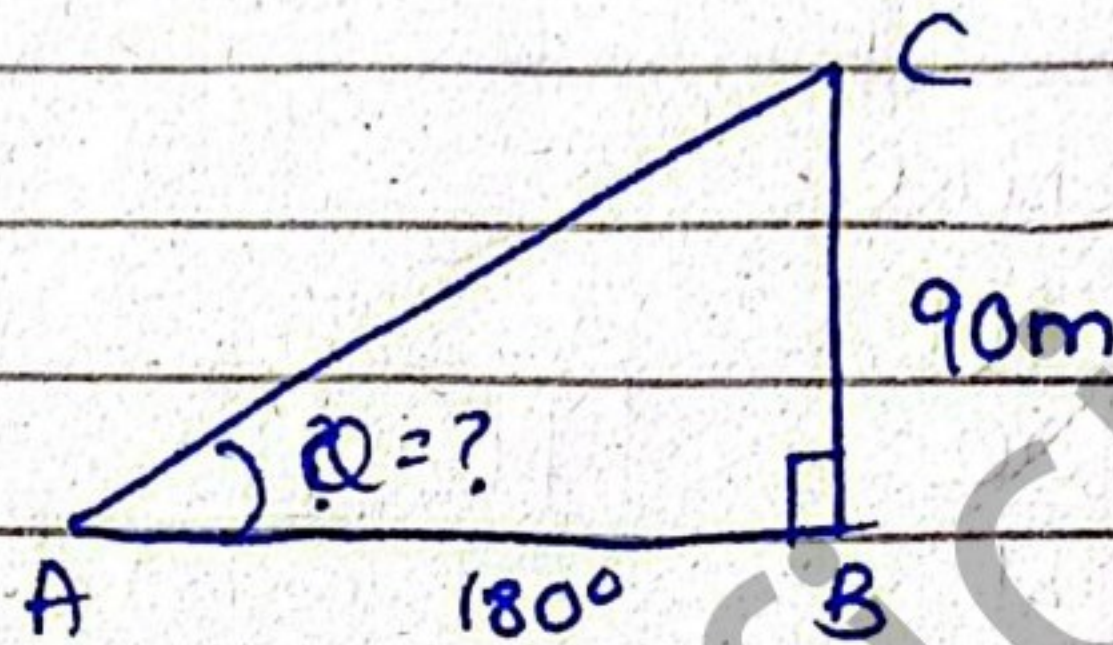
As $\tan \theta = \frac{120}{250}$
 $\theta = \tan^{-1}\left(\frac{120}{250}\right)$

$$\boxed{\theta = 25.64^\circ}$$



As we know angle of elevation = angle of depression
 so angle of depression = $\alpha = 26.64^\circ$

Q6) Sol

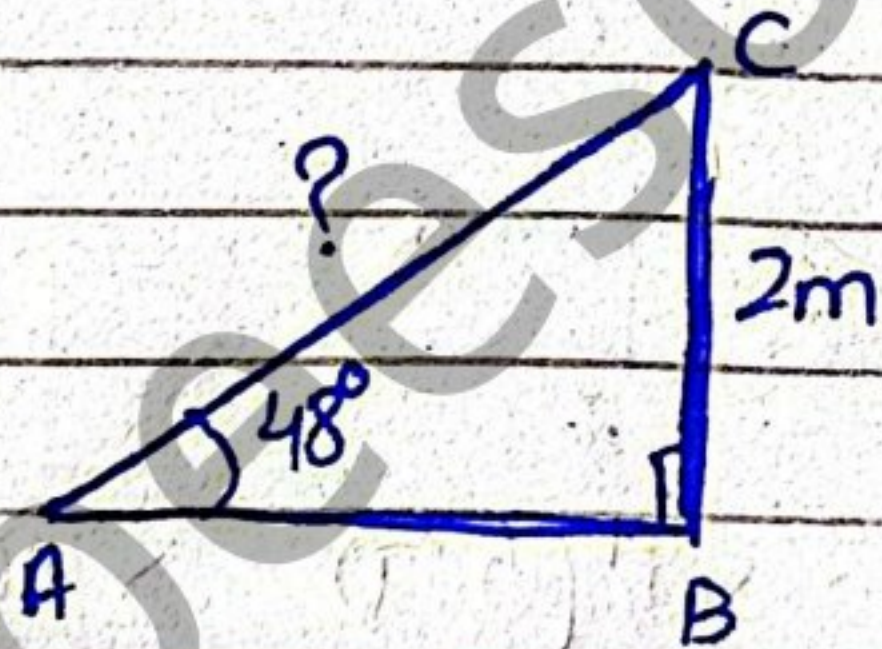


$$\tan \alpha = \frac{90}{180}$$

$$\alpha = \tan^{-1} \left(\frac{90}{180} \right)$$

$$\boxed{\alpha = 26.56}$$

Q7) Solution



As $\sin \alpha = \frac{\text{Perp}}{\text{Hyp}}$

$$\sin 48 = \frac{2}{H} \Rightarrow H = \frac{2}{\sin 48} = 2.69 \text{ m}$$

Q8) Solution: - Using pythagoras theorem

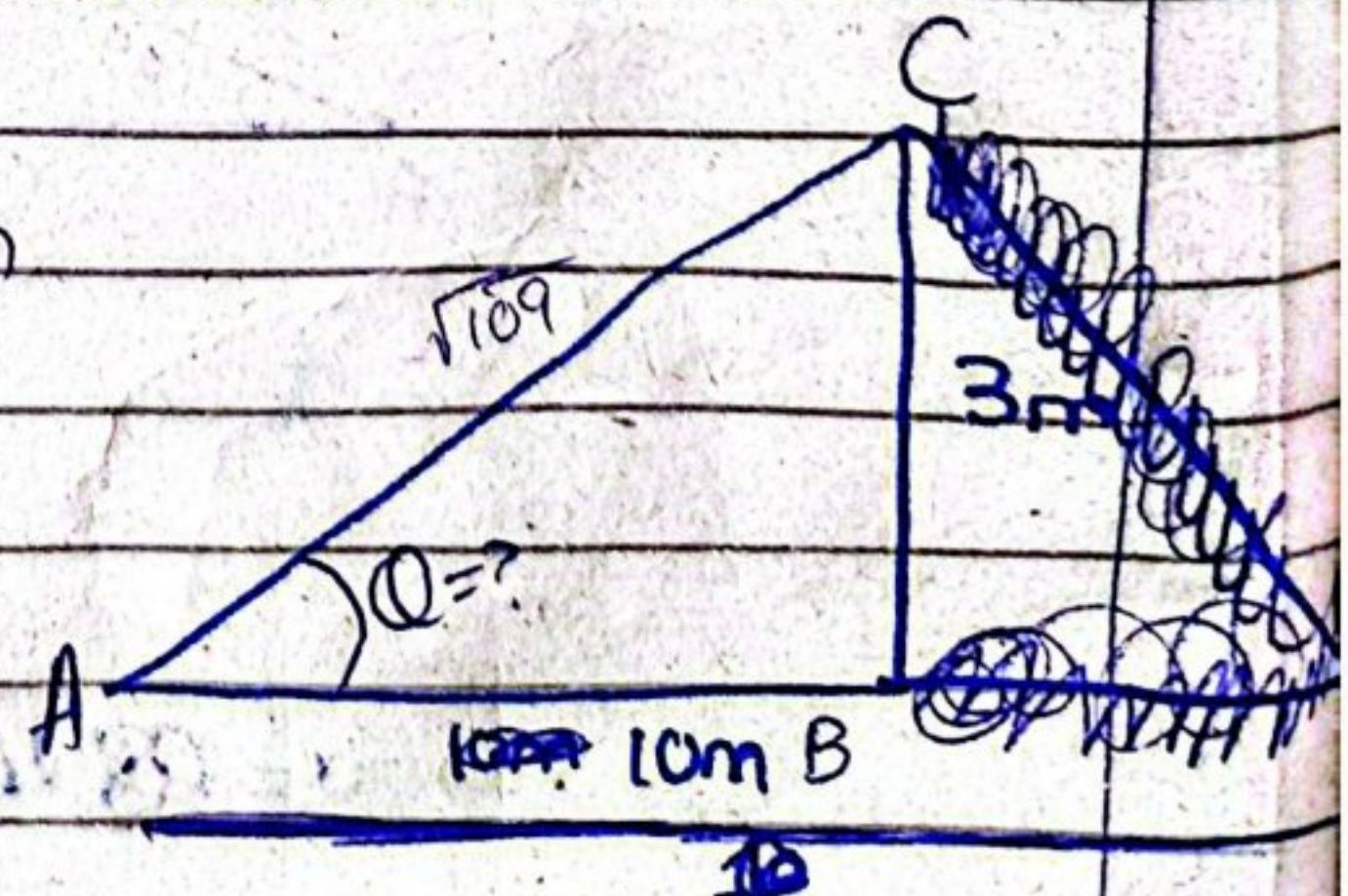
$$H^2 = 100 + 9 = 109$$

$$\boxed{H = \sqrt{109}}$$

As $\cos \alpha = \frac{\text{Base}}{\text{Hyp}}$

$$\alpha = \cos^{-1} \left(\frac{10}{\sqrt{109}} \right)$$

$$\boxed{\alpha = 16.6^\circ} \checkmark$$



Q9) Solution:- To find Base

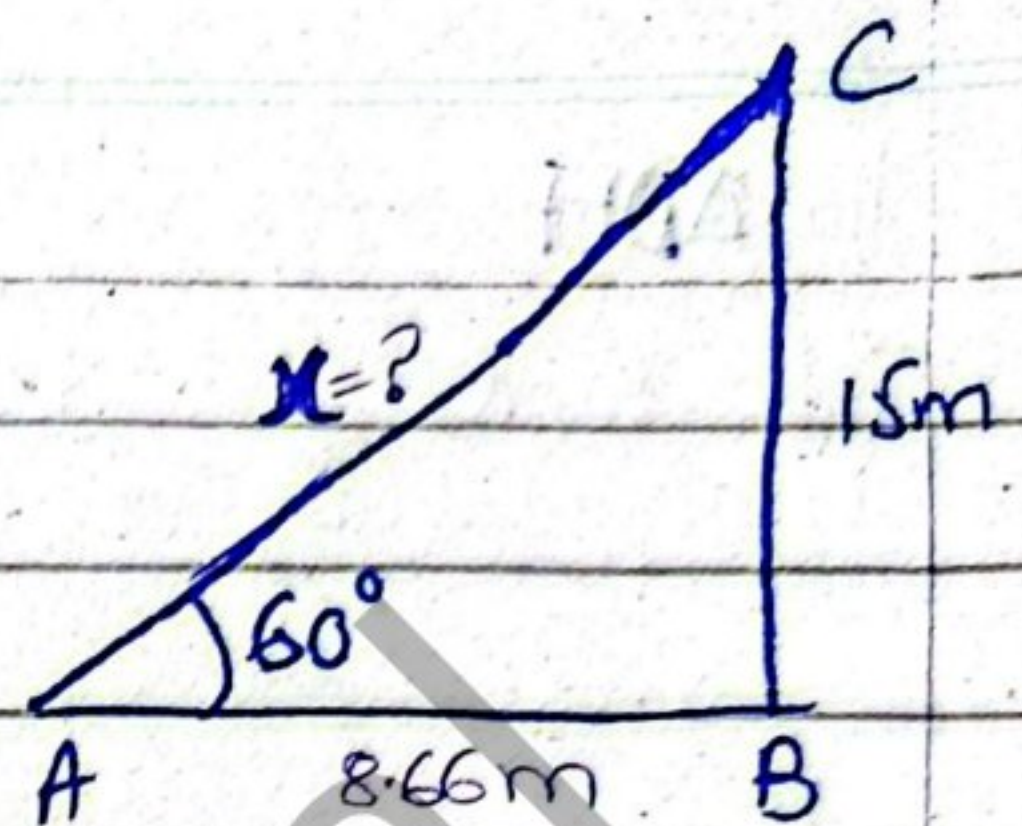
$$\tan \theta = \frac{P}{B}$$

$$\tan 60^\circ = \frac{15}{B}$$

$$B = 8.66m$$

Now $\cos \theta = \frac{8.66m}{x}$

$$x = \frac{8.66}{\cos(60)} \Rightarrow 17.32m$$



Q10) Solution:-

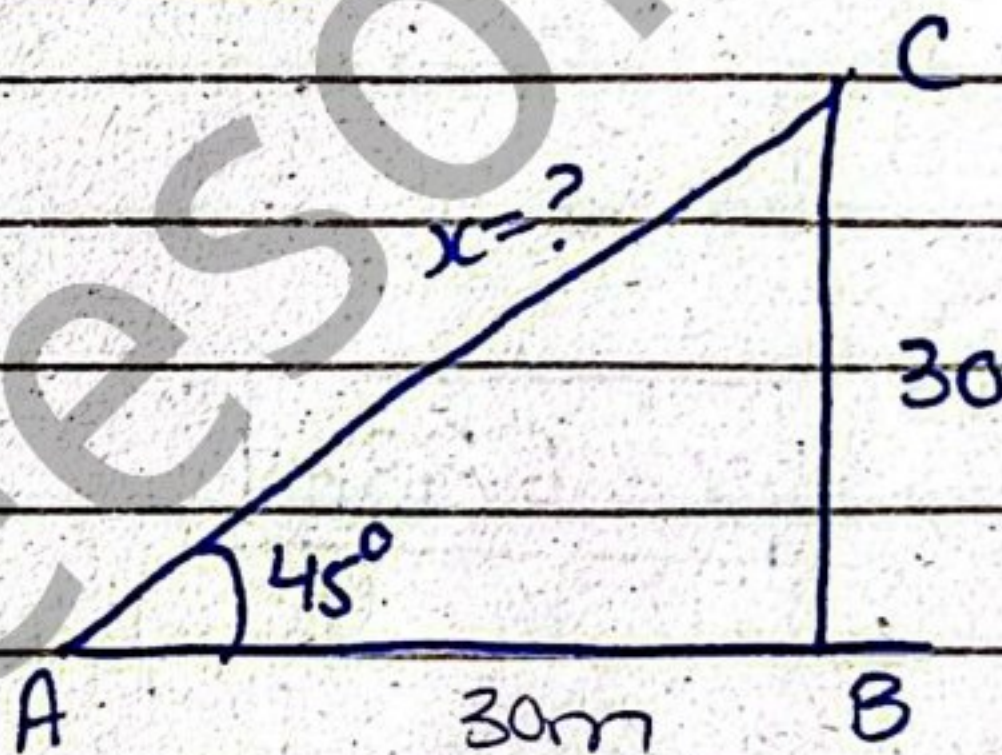
$$\tan \theta = \frac{P}{B}$$

$$\tan 45^\circ = \frac{30}{B}$$

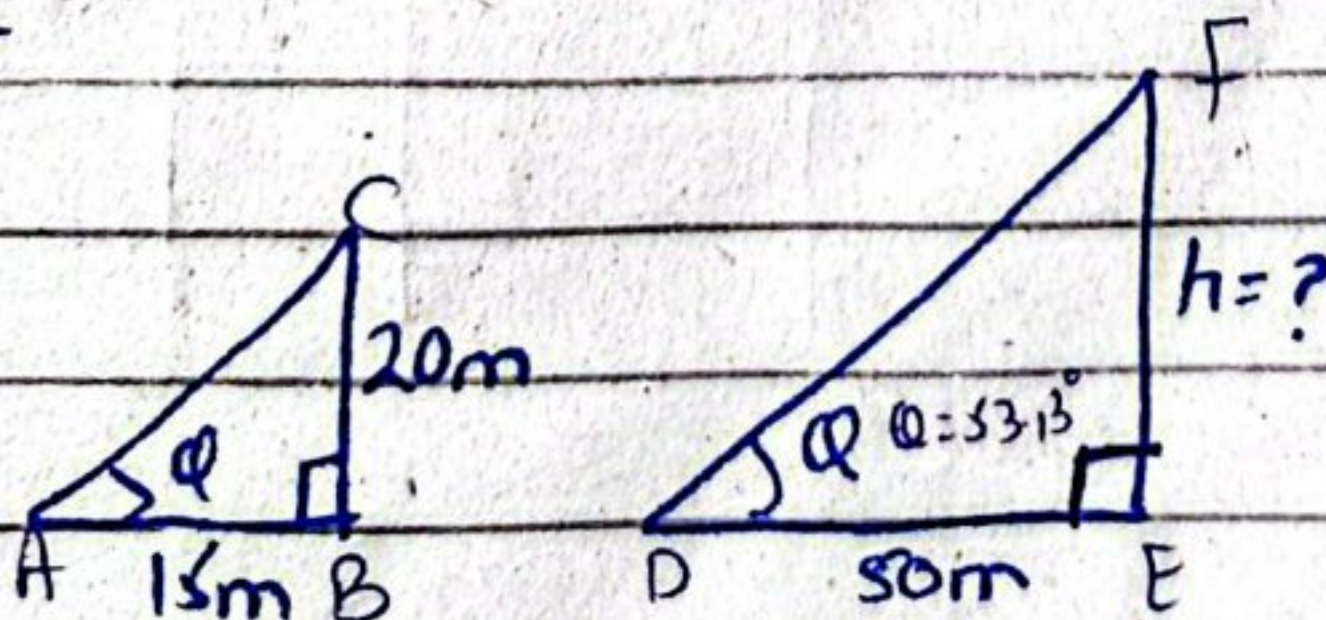
$$B = \frac{30}{\tan(45^\circ)} \Rightarrow B = 30m$$

Now $\cos 45 = \frac{30}{x}$

$$x = \frac{30}{\cos(45)} \Rightarrow x = 42.42m$$



Q11) Solution:-



$$\tan \theta = \frac{20}{15} \Rightarrow \theta = \tan^{-1}\left(\frac{20}{15}\right) \Rightarrow 53.13$$

In $\triangle DEF$

$$\text{Use } \tan \theta = \frac{P}{B} \Rightarrow \tan 53.13^\circ = \frac{h}{50} \Rightarrow h = 50 \tan 53.13^\circ$$

$$\boxed{h = 66.6 \text{ m}}$$

(12)

$\angle = 20^\circ$

$$\overline{AC} = 12 \text{ m}$$

$$\overline{AB} = 6 \text{ m}$$

Height = $h = ?$

In $\triangle ABD$

$$\text{As } \cos \theta = \frac{B}{H}$$

$$\cos 20^\circ = \frac{6}{x}$$

$$x = \frac{6}{\cos 20^\circ}$$

$$\boxed{x = 6.38 \text{ m}}$$

$$\text{Now } \sin \theta = \frac{P}{H} \Rightarrow \sin 20^\circ = \frac{h}{6.38} \Rightarrow h = 6.38 \sin 20^\circ$$

$$\boxed{h = 2.18 \text{ m}}$$

(13)

$$\text{As } \cos 30^\circ = \frac{10}{x}$$

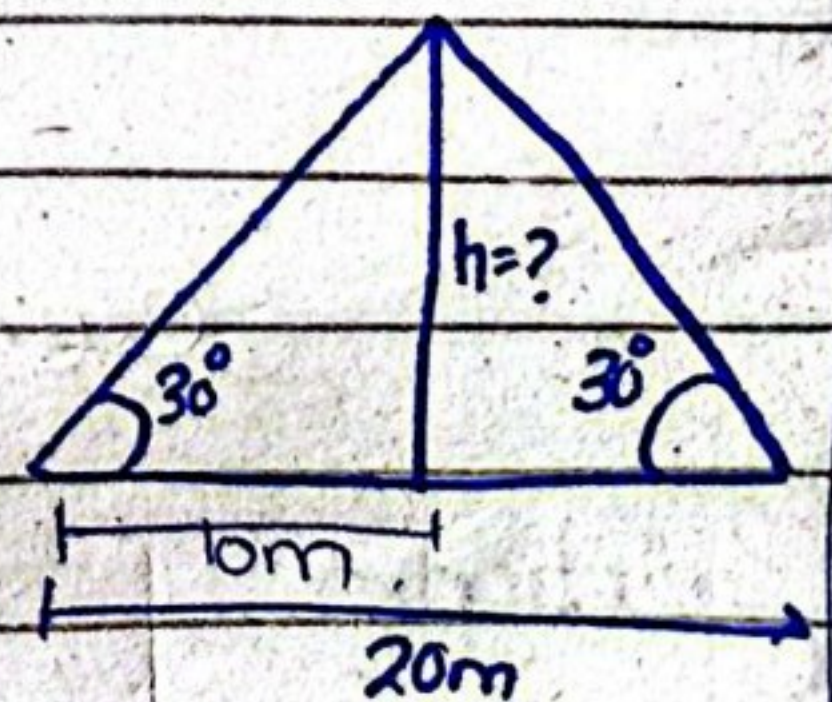
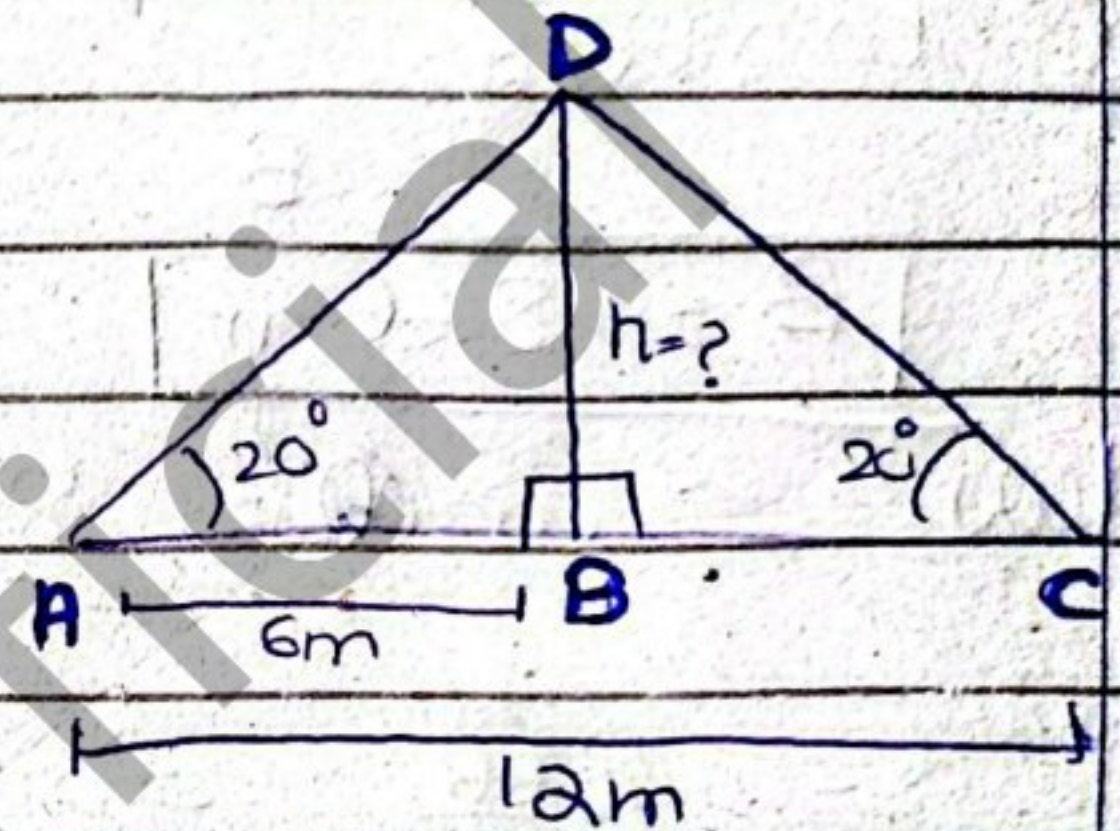
$$x = \frac{10}{\cos 30^\circ} = 11.54 \text{ m}$$

$$\text{Now } \sin \theta = \frac{P}{H}$$

$$\sin 30^\circ = \frac{h}{11.54}$$

$$h = 11.54 \sin 30^\circ \Rightarrow$$

$$\boxed{h = 5.77 \text{ m}}$$



Q14

$$\tan \theta = \frac{P}{B}$$

$$\theta = \tan^{-1}\left(\frac{3}{4}\right) \Rightarrow \boxed{\theta = 36.8^\circ}$$

