CLASS 10 ACADEMIC PROGRAM-2020

GENERAL MATH

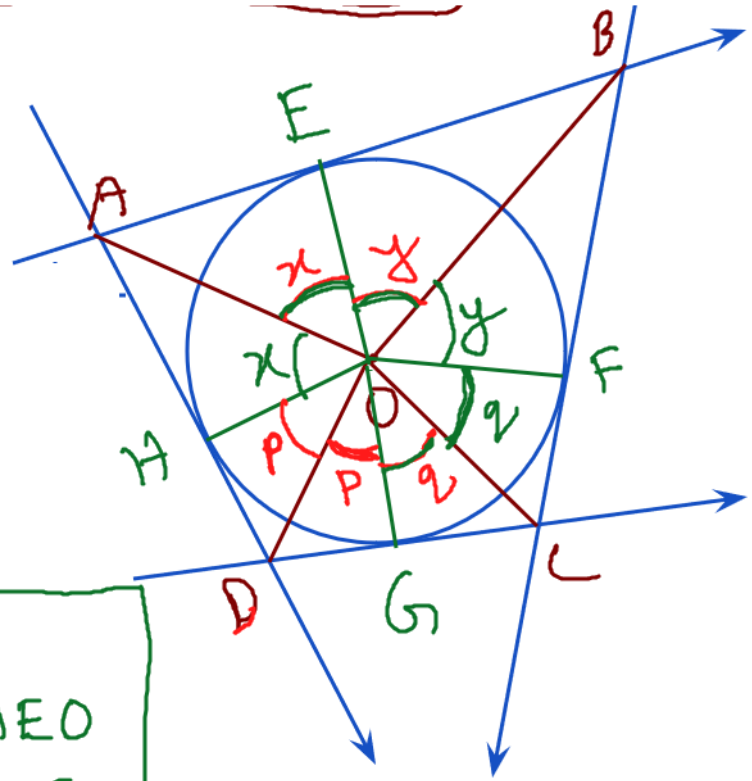
Lecture : M-27

Chapter 10 : Distance and Elevation

অনুশীলনী ৮.৪ এর ৪ নং প্রশ্নের সমাধান

We have to prove: $\angle AOB + \angle COD = 180^\circ$

$x + y + p + q = 180^\circ$



$\triangle DOH$, $\triangle GOD$

$\angle DHO = \angle DGO = 90^\circ$

OD common side

$OH = OG$ = radius

$\therefore \triangle DHO \cong \triangle GOD$; [RHS Theorem]

$\angle DOH = \angle GOD$

Similarly,

$\triangle AHO \cong \triangle AEO$

$\triangle BOE \cong \triangle BOF$

$\triangle GOC \cong \triangle COF$

$2p + 2q + 2x + 2y = 360^\circ$

$p + q + x + y = 180^\circ$

POLL QUESTION -01

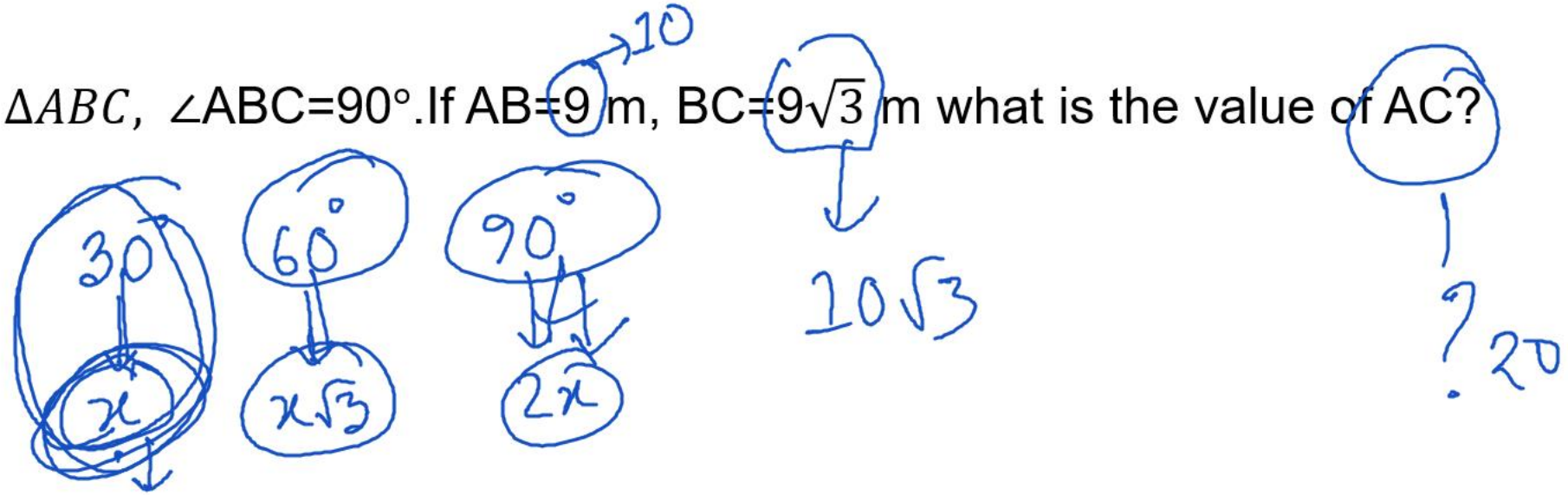
❑ In right Angled ΔABC, $\angle ABC=90°$.If AB=9 m, BC=$9\sqrt{3}$ m what is the value of AC?

(a) 9.5 m

(b) $18\sqrt{3}$ m

(c) 18

(d) None



POLL QUESTION -02

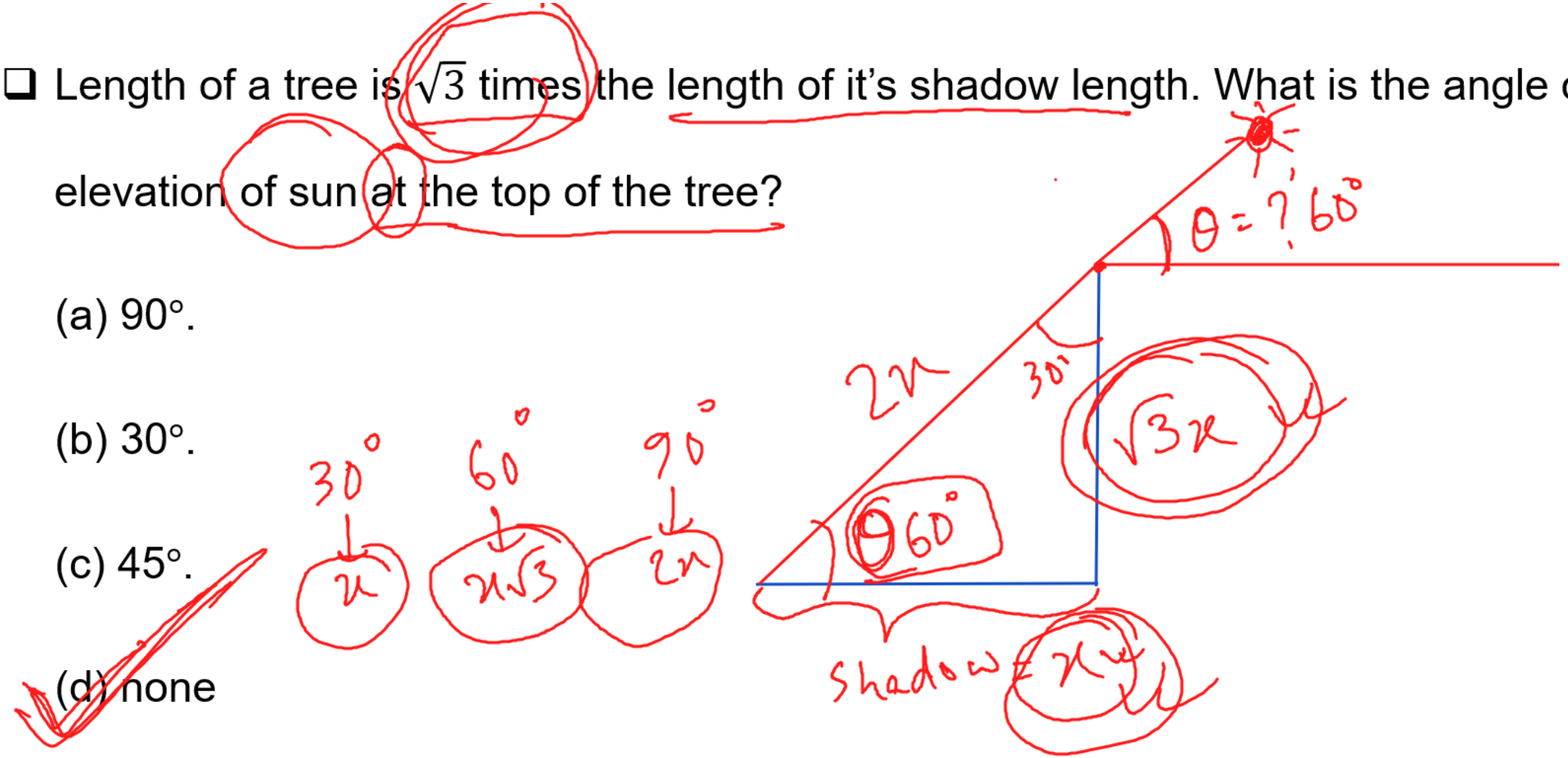
- Length of a tree is $\sqrt{3}$ times the length of it's shadow length. What is the angle of elevation of sun at the top of the tree?

  (a) 90°.

  (b) 30°.

  (c) 45°.

  (d) none



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Type 1: Example 1,2,3,4 Exercise - 10, 11, 12, 13

Type 2: Example - 5 , Exercise - 14, 15, 16

Type 3: Example - 6, Exercise → 17, 18

Type 4: Exceptional , Last activity

19(c) → Exercise

POLL QUESTION -03

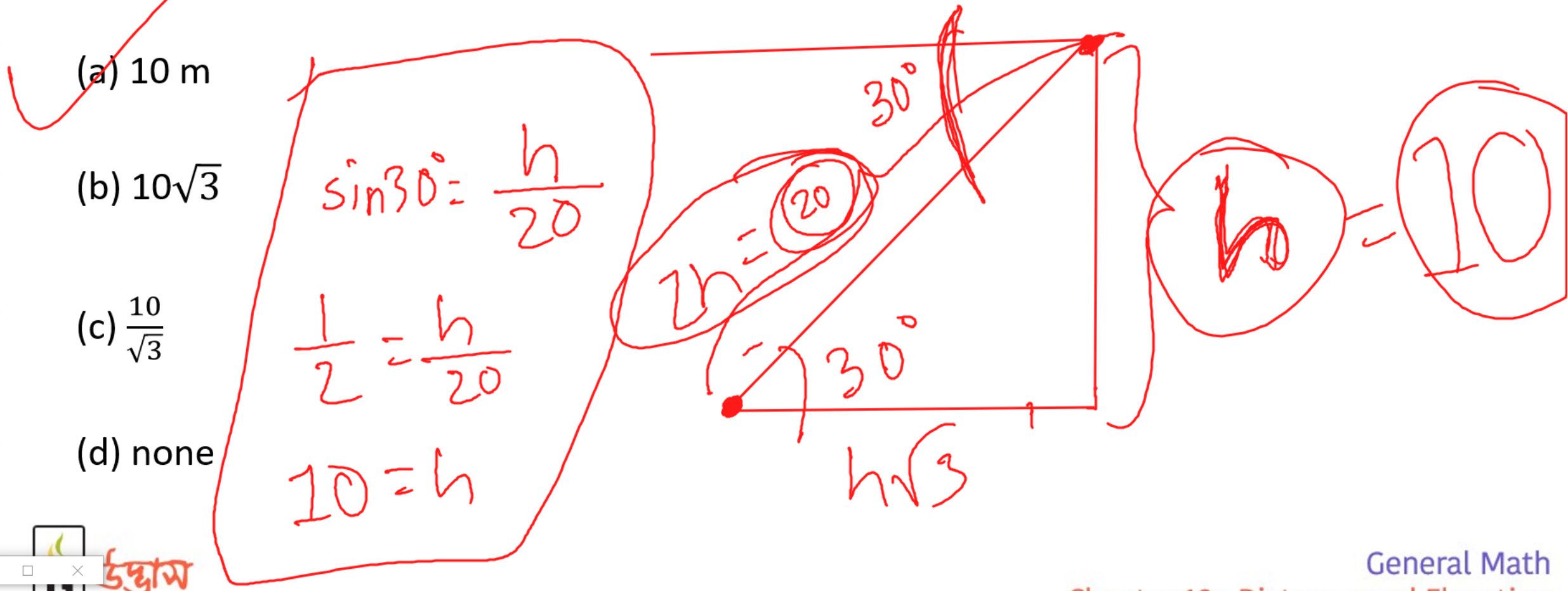
- If the angle of depression of a point on the ground 20m from the top of the house is 30°. Then find the height of the house.

(a) 10 m

(b) $10\sqrt{3}$

(c) $\frac{10}{\sqrt{3}}$

(d) none



POLL QUESTION -04

- A tree is broken by a storm such that the broken part makes an angle of 30°. with the other and touches the ground at a distance of 12m from it.Find the length of the whole tree.

(a) $24+12\sqrt{3}$ m

(b) $12+12\sqrt{3}$ m

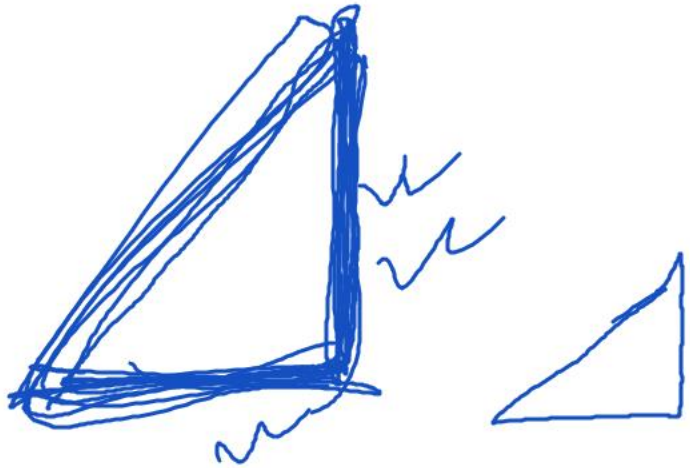
(c) $24+24\sqrt{3}$ m

(d) 24 m

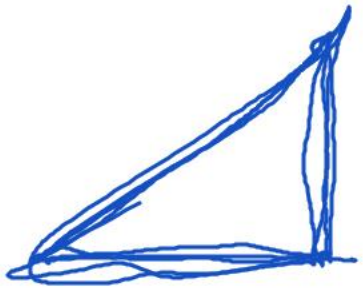
SOME IMPORTANT TOPICS

Horizontal line:

Vertical line:

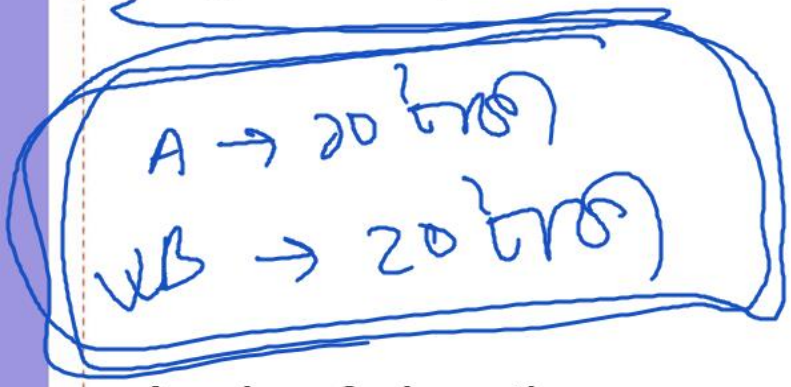


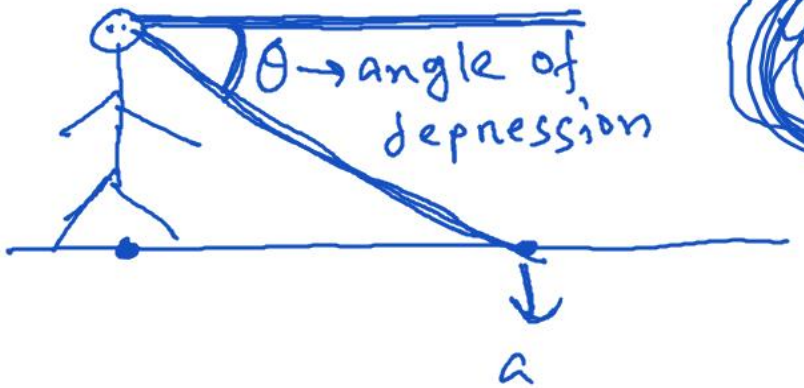
Vertical plane:

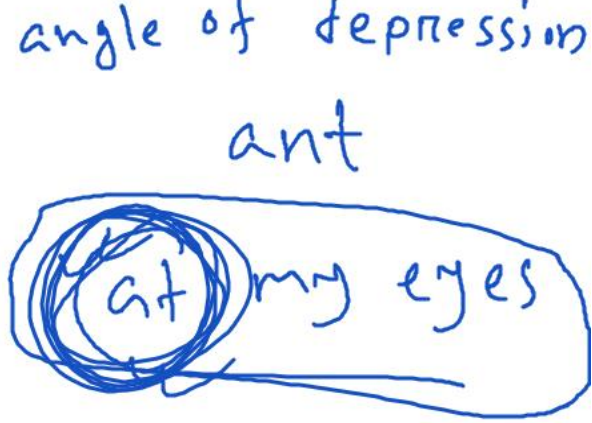


SOME IMPORTANT TOPICS

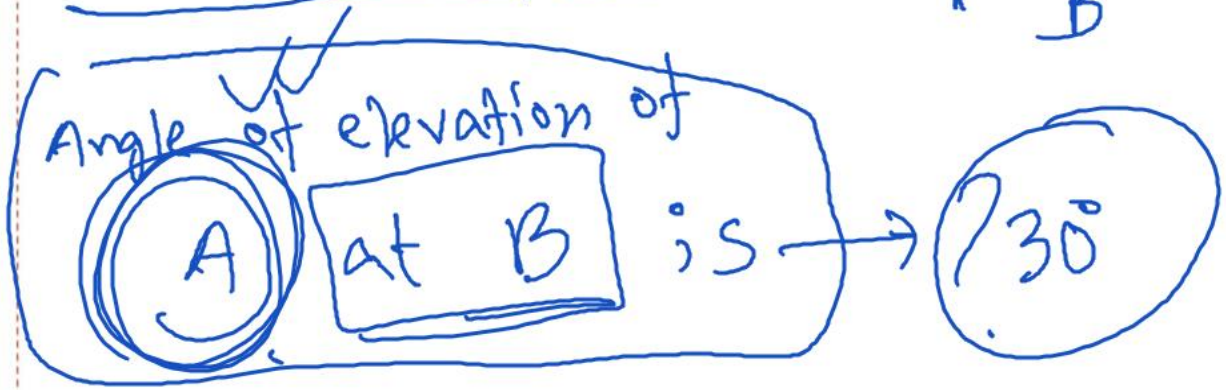
Angle of depression:

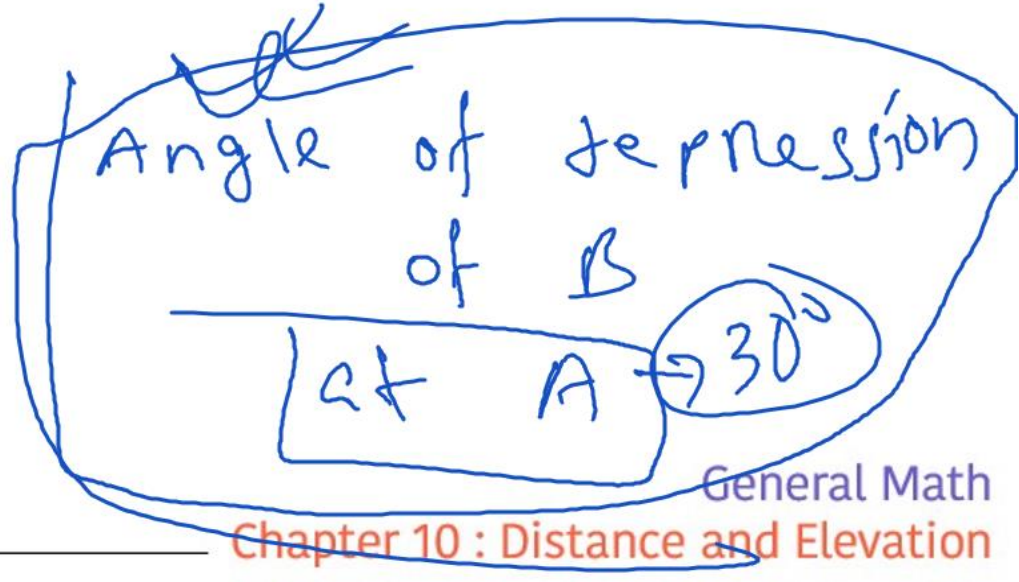






Angle of elevation:





TYPE-01

11. If the top of a tree is 20m distance from the foot on he ground at any point and the angle of elevation of 60°, find the height of the tree.

TYPE-01

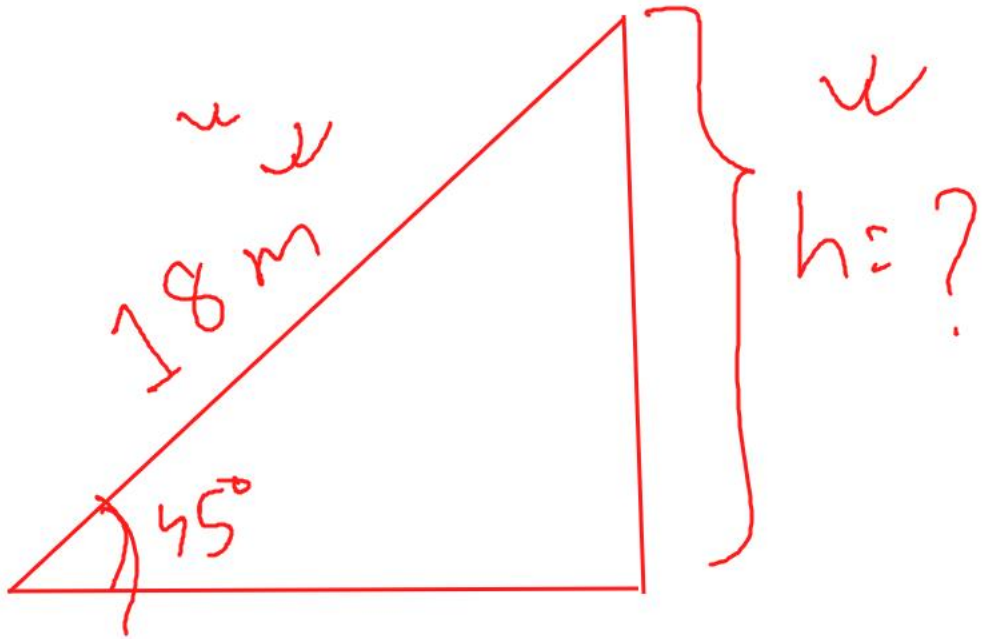
12. Forming 45° angle with ground and 18m long ladder touches the top of the wall, find the height of the wall.

$$\sin 45^\circ = \frac{h}{18}$$

$$\frac{1}{\sqrt{2}} = \frac{h}{18}$$

$$\frac{18\sqrt{2}}{\sqrt{2}\times\sqrt{2}} \leftarrow \frac{18}{\sqrt{2}} = h$$

$$= \frac{18\sqrt{2}}{2} \rightarrow 9\sqrt{2} = h$$



TYPE-02

15. The angle of elevation of a tower becomes 60° from 45° by moving 60m towards a minar. Find the height of the minar.

In $\triangle ABC$,

$$\tan 60^\circ = \frac{h}{x}$$

$$\sqrt{3} = \frac{h}{x}$$

$$x\sqrt{3} = h$$

$$\therefore h = \frac{60\sqrt{3}}{\sqrt{3}-1}$$

$$= \frac{60\sqrt{3}(\sqrt{3}+1)}{(\sqrt{3}-1)(\sqrt{3}+1)}$$

$$= \frac{60\sqrt{3}(\sqrt{3}+1)}{2}$$

In $\triangle ADC$,

$$\tan 45^\circ = \frac{h}{x+60}$$

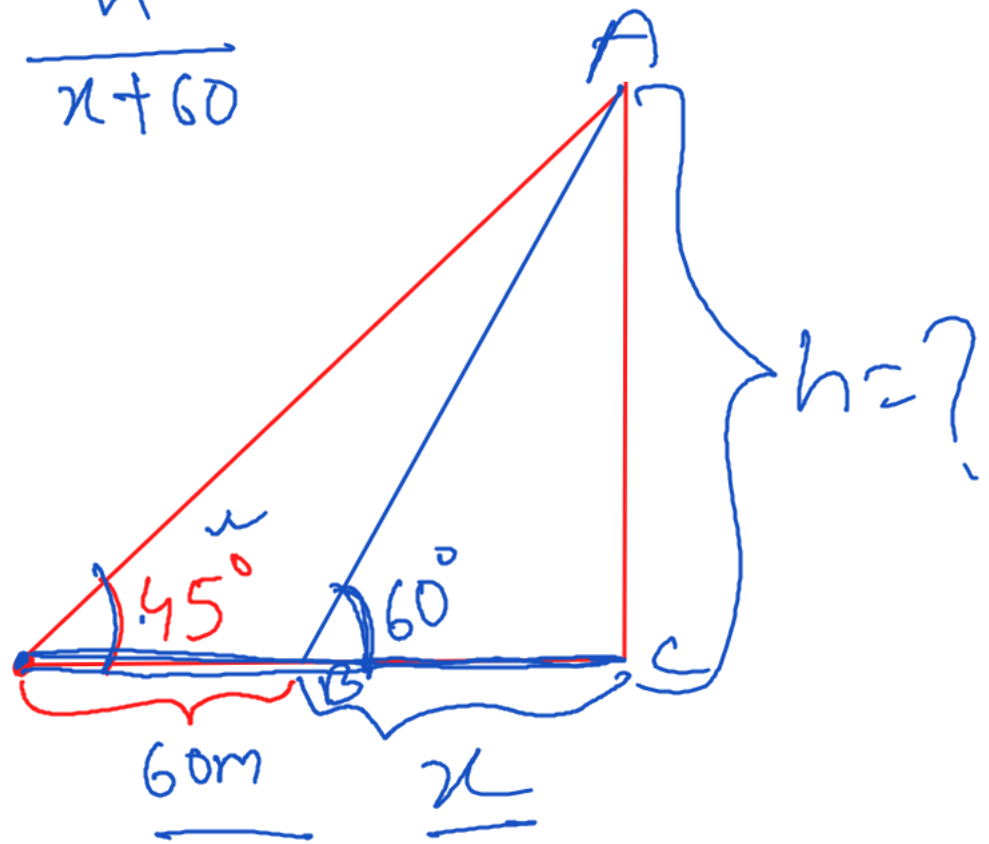
$$1 = \frac{h}{x+60}$$

$$x+60 = h$$

$$x+60 = x\sqrt{3}$$

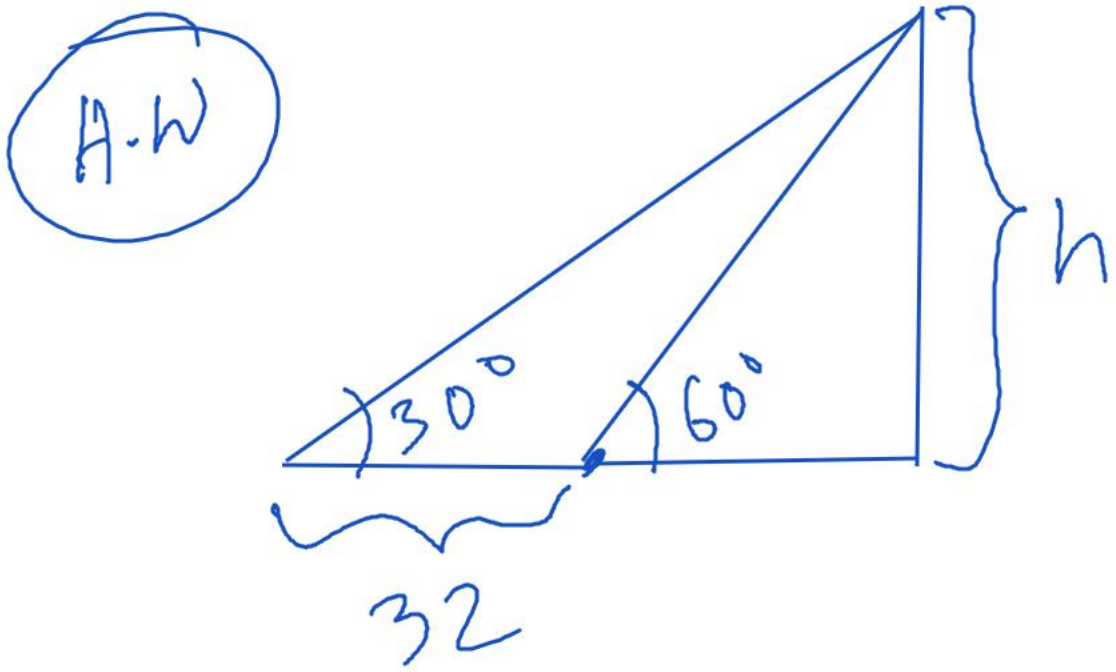
$$60 = x(\sqrt{3}-1)$$

$$\frac{60}{\sqrt{3}-1} = x$$



TYPE-02

16. A man standing at a place on the bank of a river observed that the angle of elevation of a tower exactly opposite to him on the other bank was 60°. Moving 32m back he observed that the angle of elevation of the tower was 30°. Find the height of the tower and the width of the river.



TYPE-03

17. A pole of 64m long breaks into two parts without complete separation and makes an angle 60^0 with the ground. Find the length of the broken part of the pole.

TYPE-04

Practice Problem:

- A balloon is flying above any point between two mile posts. At the point of the balloon the angle of depression of the two posts are 30° and 60° respectively Find the height of the balloon.

Important

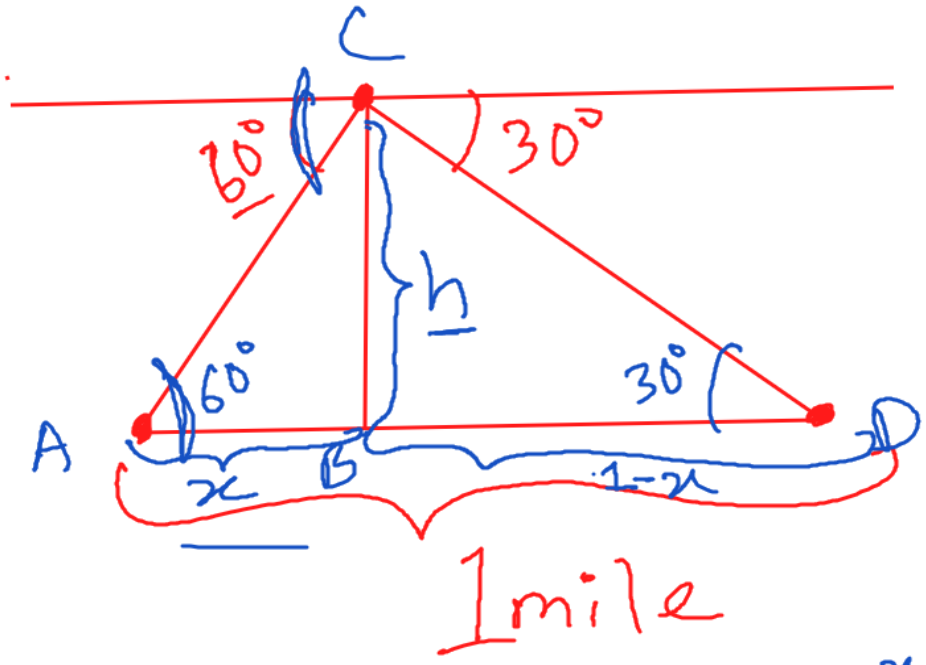
In $\triangle ABC$,

$$\tan 60^\circ = \frac{h}{x}$$

$$\sqrt{3} = \frac{h}{x}$$

$$x\sqrt{3} = h$$

Do yourself



In $\triangle BCD$,

$$\tan 30^\circ = \frac{h}{1-x}$$

$$\frac{1}{\sqrt{3}} = \frac{x\sqrt{3}}{1-x}$$

x = Do yourself

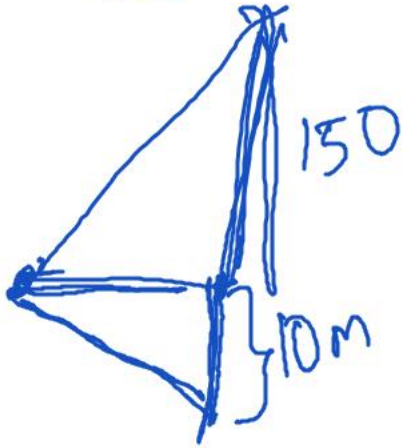
TYPE-04

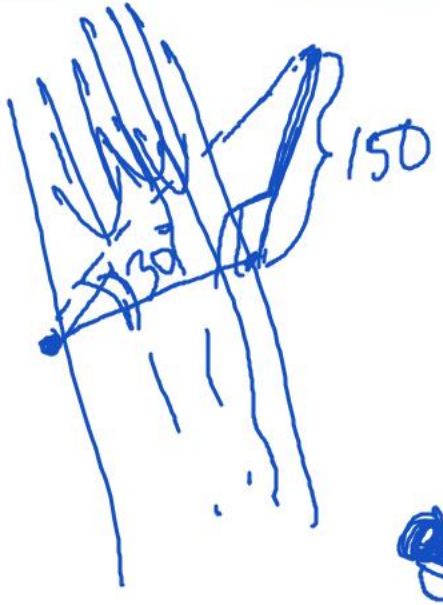
19. Standing any where on the bank of a river, a man observed that the angle of elevation of a 150m long tree exactly straight to him on the other bank is 30°. The man started for the tree by a boat But he reached at 10m away from the tree due to current.

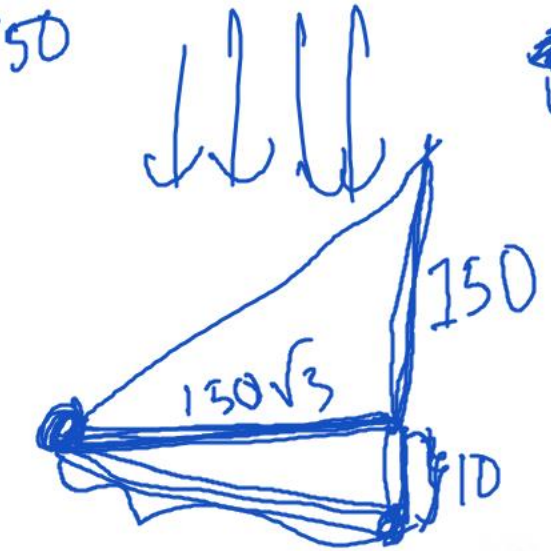
1) Show the above description by a figure.

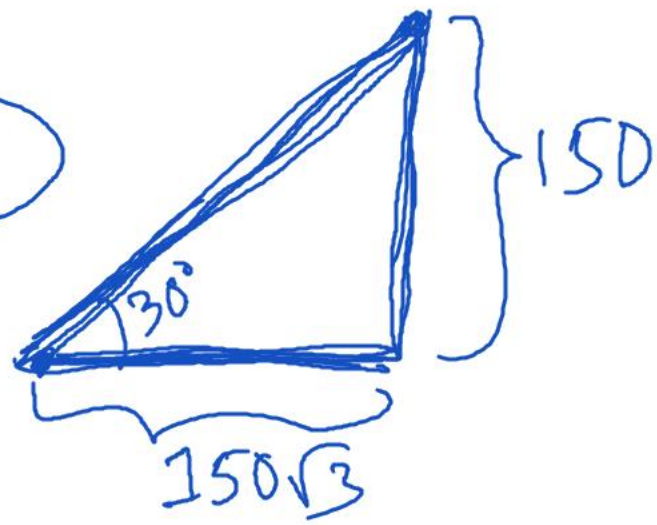
2) Find the width of the river.

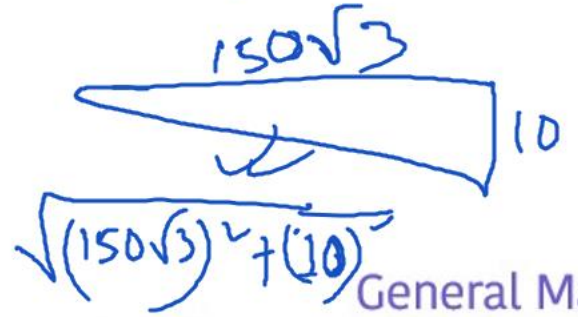
3) Find the distance from the starting point to the destination.











না বুঝে মুখস্থ করার অভ্যাস প্রতিভাকে ধ্বংস করে