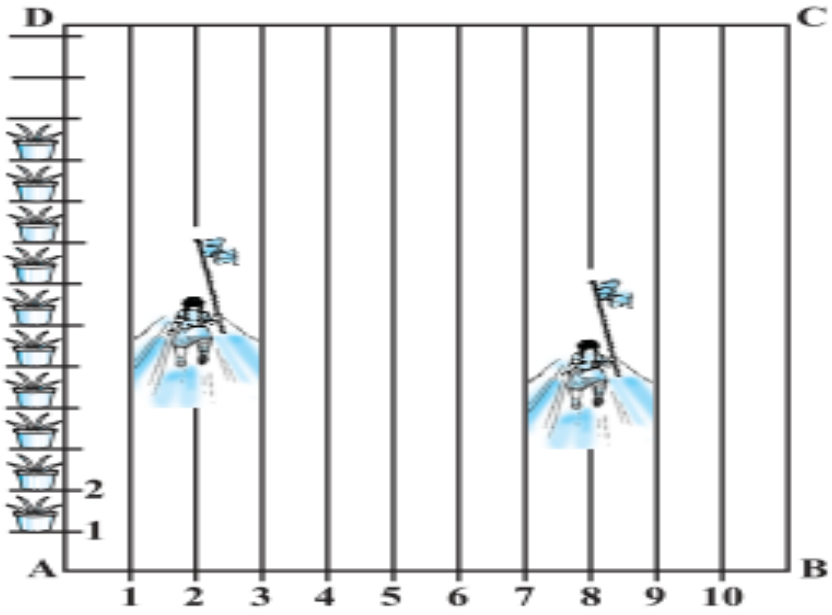
CLASS-X (MATHS) CBT SEPTEMBER-2024

- ***COORDINATE GEOMETRY***
- ***INTRODUCTION TO TRIGONOMETRY***

Case Study :-

To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in following figure. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs1/5 th the distance AD on the eighth line and posts a red flag. Taking A as the origin AB along x-axis and AD along y-axis, answer the following questions



(1) The coordinate of green flag are

(A) (2,25)

(B) (2,0.25)

(C) (25,2)

(D) (0,-25)

(2) The coordinate of red flag are

(A) (8,0)

(B) (20,.8)

(C) (8,20)

(D) (8,0.2)

(3) The distance between two flags is

(A) $\sqrt{45}$ m

(B) $\sqrt{11}$ m

(C) $\sqrt{61}$ m

(D) $\sqrt{51}$ m

(4.) If Rashmi has to post a blue flag exactly half way between the line segment joining the two flags, where should she post her flag?

(A)(5, 22.5)

(B) (10,22)

(C) (2,8.5)

(D) (2.5,20)

(5) If Joy has to post a flag one fourth distance from the green flag, in the line segment joining the green and red flags, then where should he post his flag?

(A) (2,25)

(B) (8,20)

(C) (3.5,24)

(D) (3.5 ,23.75)

ANSWER:

(1) (A)(2,25)

The green flag is posted on second line at a distance of 25 m from AB. So, the coordinate of the point where the green flag is posted are (2,25)

(2) (C) (8,20)

Preet posted red flag on 8 th line at a distance of 20 m from AB. So ,the coordinates of the point where red flag is put are (8,20) .

(3) (C) $\sqrt{61}$ m

The coordinates of G (2,25) and R (8,20)

By distance formula

GR =$\sqrt{61}$ m

(4) (A)(5, 22.5)

The coordinates of G (2, 25) and R (8,20)

By mid point formula

Mid point of GR (5, 22.5)

(5) (D) (3.5 ,23.75)

The coordinates of G (2,25) and R (8,20)

By using section formula coordinates of the point divides GR in the ratio $\frac{1}{4}$: $\frac{3}{4}$ i.e. 1:3 are

$\left(\frac{1\times8+3\times2}{1+3}, \frac{1\times20+3\times25}{1+3}\right)$ = (3.5 ,23.75)

Case Study :-

A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

6. What is the angle of elevation if they are standing at a distance of 42 m away from the monument?

(A) 30^0

(B) 45^0

(C) 60^0

(D) 0^0

7. They want to see the tower at an angle of $60°$. So, they want to know the distance where they should stand and hence find the distance.

(A) 24.24 m

(B) 20.12 m

(C) 42 m

(D) 24.64 m

8. If the altitude of the Sun is at 60^0 , then the height of the vertical tower that will cast a shadow of length 20 m is

(A)$20\sqrt{3}$ m

(B) $\frac{20}{\sqrt{3}}$ m

(C) $\frac{15}{\sqrt{3}}$ m

(D) $15\sqrt{3}$ m

9. The ratio of the length of a rod and its shadow is 1:1 . The angle of elevation of the Sun is

(A) 30^0

(B) 45^0

(C) 60^0

(D) 90^0

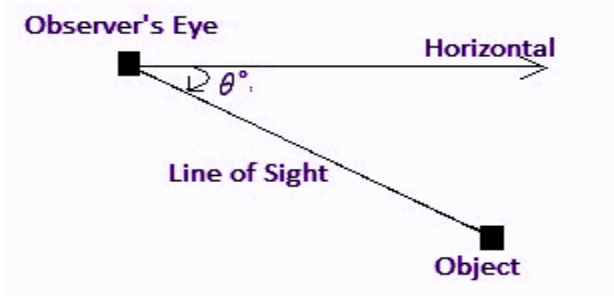
10. The angle formed by the line of sight with the horizontal when the object viewed is below the horizontal level is

(A) corresponding angle

(B) angle of elevation

(C) angle of depression

(D) complete angle



ANSWER

6. (B) 45^0

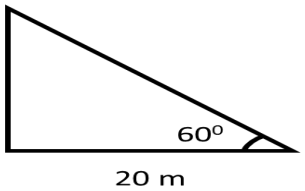
tan θ = $\frac{42}{42}$ =1 , θ= **45°**

7. (A) 24.24 m

tan 60°= $\frac{42}{x}$, x = $\frac{42}{\sqrt{3}}$, x = $\frac{42}{3}$ × $\sqrt{3}$ =14$\sqrt{3}$= 24.24 m

8. (A)20√3 m

tan 60°= $\frac{h}{20}$, h= 20√3 m



9. (B) 45°

tan θ =1 , θ= 45°

10. (C) angle of depression