UDAAN

2026

Coordinate Geometry

MATHS LECTURE-5

BY-RITIK SIR

Topics *to be covered*

A CBSE 2025 questions discussion

B Case based questions

#Q. The mid-point P of the line segment joining the points A (–10, 4) and B (–2, 0) lies on the line segment joining the points C (–9, –4) and D (–4, y). Find the ratio in which P divides CD. Also, find the value of y.

CBSE 2014

A $3 : 2, y = 5$

B $2 : 3, y = 6$

C $3 : 2, y = 6$

D $2 : 3, y = 5$

$$-6 = \frac{-4k + -9}{k+1}$$

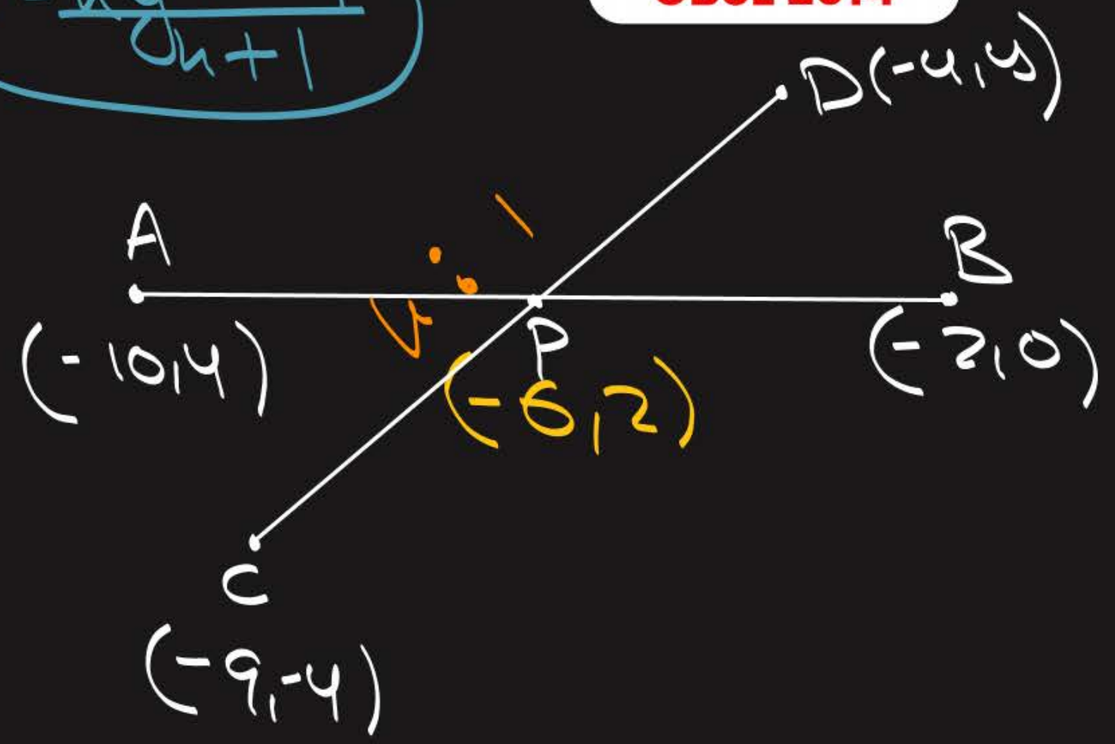
$$-6k - 6 = -4k - 9$$

$$-6 + 9 = -4k + 6k$$

$$3 = 2k$$

$$\frac{3}{2} : k$$

$$2 = \frac{ky + -4}{2k+1}$$



#Q. If the point C (–1, 2) divides internally the line segment joining the points A (2, 5) and B (x, y) in the ratio 3 : 4, find the value of $x^2 + y^2$.

CBSE 2016

A 26

B 27

C 28

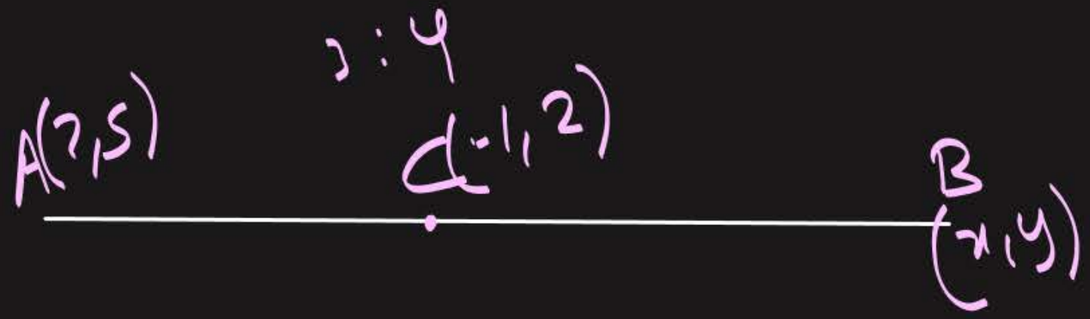
D 29

$= x^2 + y^2$

$= (-5)^2 + (-2)^2$

$= 25 + 4$

$= 29$



$-1 = \frac{3x+8}{3+4}$

$-7 = 3x + 8$

$-15 = 3x$

$x = -5$

$2 = \frac{3y+20}{3+4}$

$-6 = 3y$

$y = -2$

#Q. The distance of a point A from x-axis is 3 units. Which of the following cannot be coordinates of the point A?

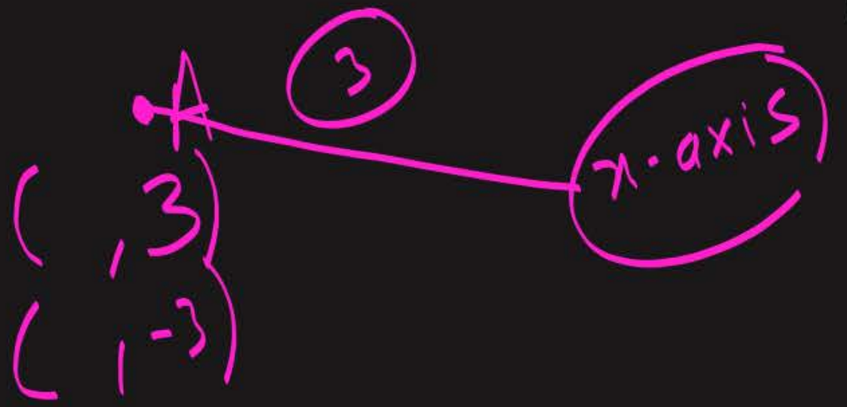
CBSE 2025

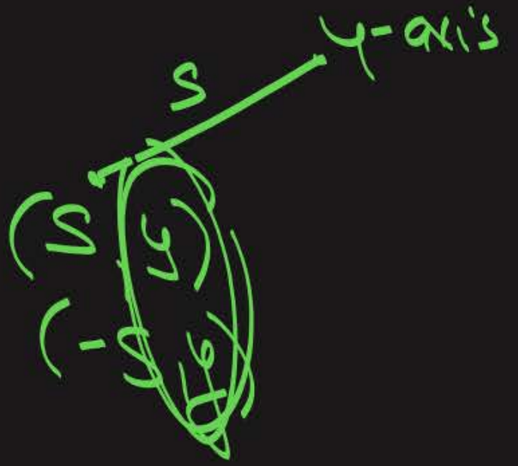
A (1, 3)

B (−3, −3)

C (−3, 3)

D (3, 1)





#Q. Find the coordinates of the point C which lies on the line AB produced such that AC = 2BC, where coordinates of points A and B are (–1, 7) and (4, –3) respectively.

CBSE 2025

$AC = 2BC$

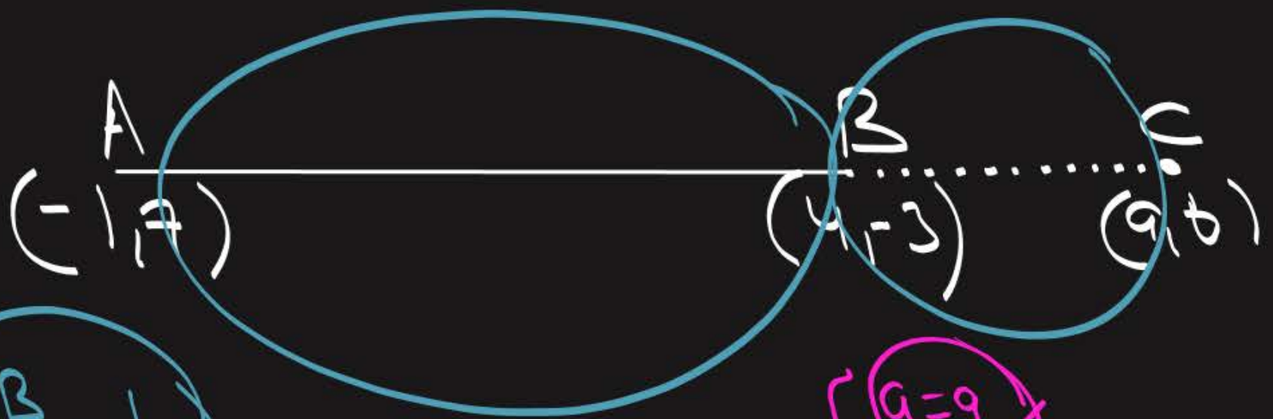
$\frac{AC}{BC} = \frac{2}{1}$

$\frac{AB + BC}{BC} = \frac{2}{1}$

$AB + BC = 2BC$

$AB = BC \times 1$

$\frac{AB}{BC} = \frac{1}{1}$



$4 = \frac{a + -1}{2}$

$8 = a - 1$

$a = 9$

$-3 = \frac{b + 7}{2}$

$-6 = b + 7$

$-13 = b$

#Q. P (x, y), Q (–2, –3) and R (2, 3) are the vertices of a right triangle PQR right angled at P. Find the relationship between x and y. Hence, find all possible values of x for which y = 2.

eqn

CBSE 2025

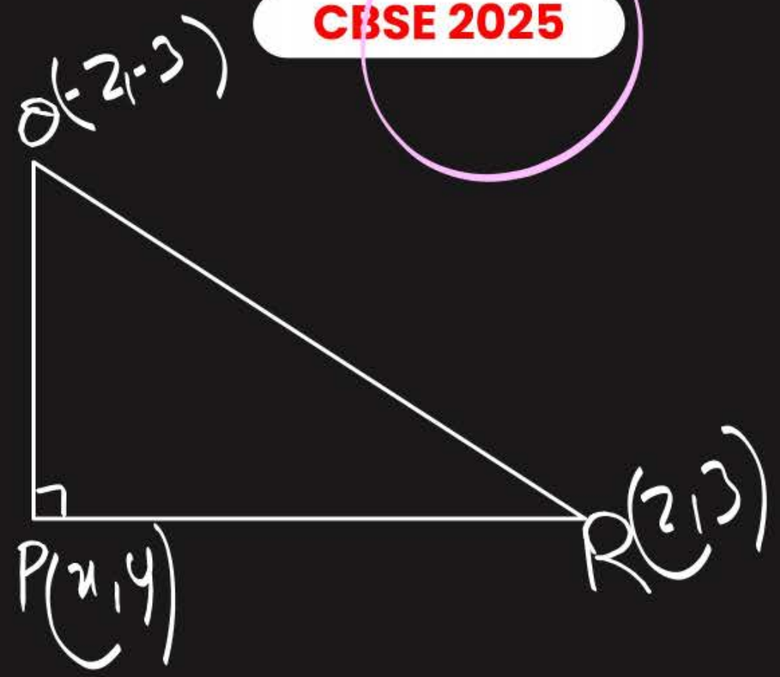
$QR^2 = PQ^2 + PR^2$

$x^2 + y^2 = 13$ //

$x^2 + 4 = 13$

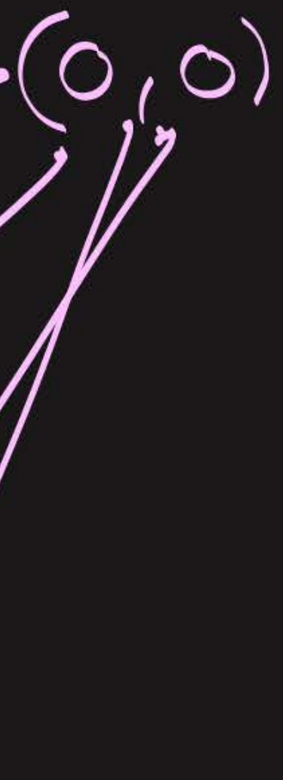
$x^2 = 9$

$x = \pm 3$ //



#Q. The distance of which of the following points from origin is less than 5 units?

CBSE 2025



A (3, 4)

B (2, 6)

C (–3, –4)

D (1, 4)

#Q. Prove that abscissa of a point P which is equidistant from points with coordinates A(7, 1) and B(3, 5) is 2 more than its ordinate.

#HOT

CBSE 2025

$PA = PB$

$\Rightarrow PA^2 = PB^2$

$(y-1)^2 + (x-7)^2 = (y-5)^2 + (x-3)^2$

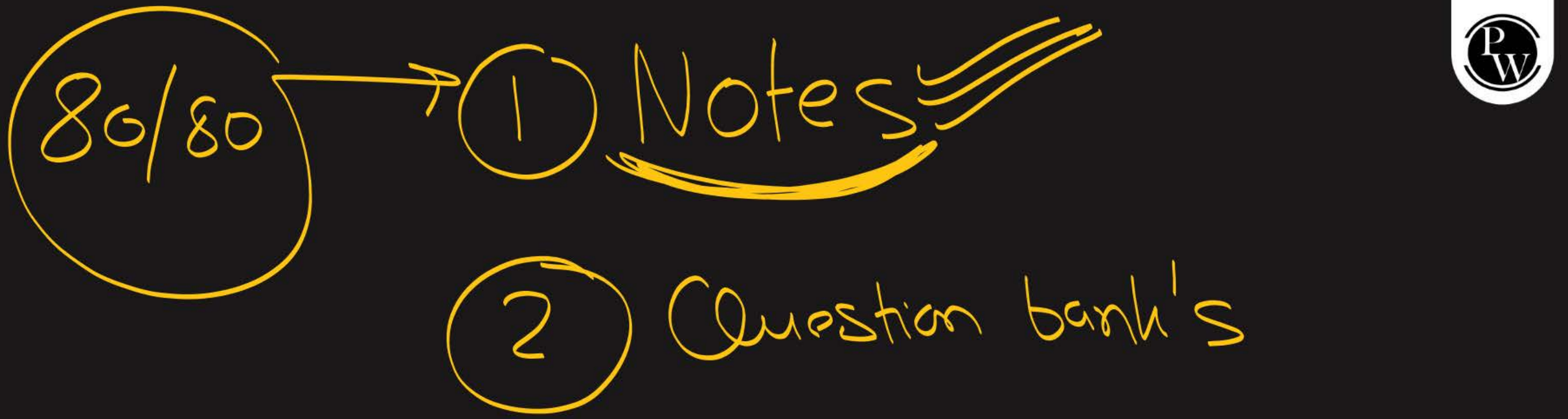
$y^2 + 1 - 2y + x^2 + 49 - 14x = y^2 + 25 - 10y + x^2 + 9 - 6x$

$50 - 2y - 14x = 34 - 10y - 6x$

$16 + 8y - 8x = 0$

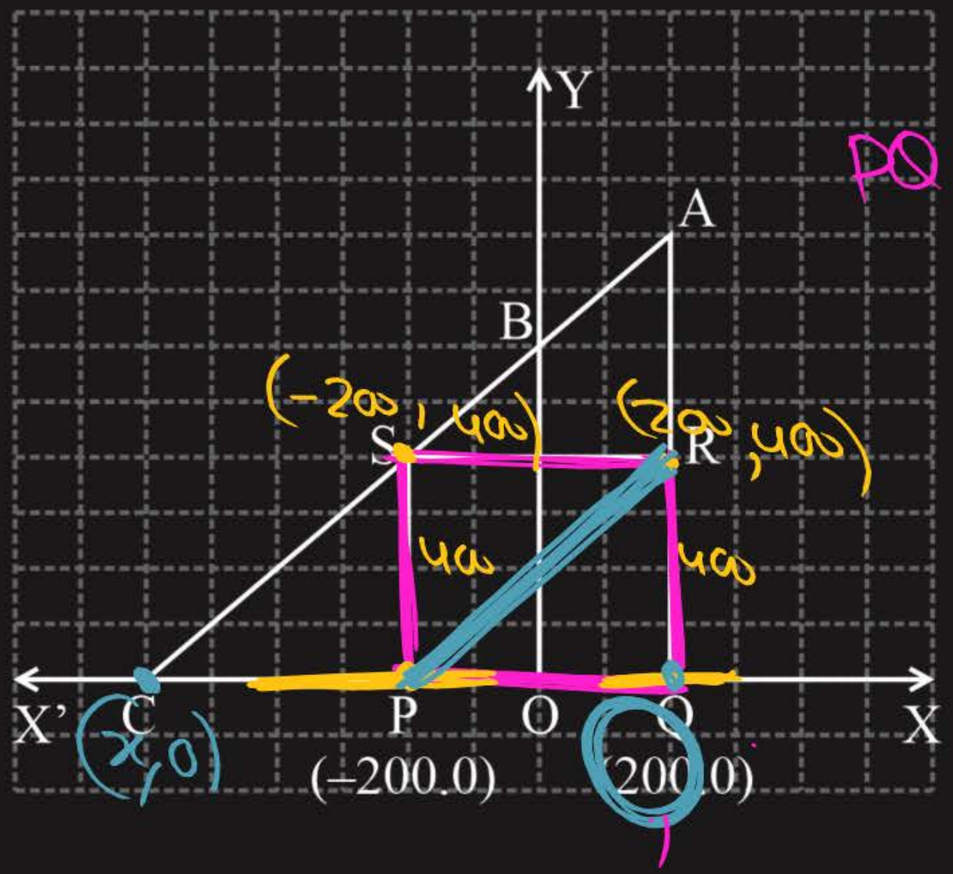
$2 + y - x = 0$

$2 + y = x$ //


80/80
1 Notes
2 Question bank's

#Q. Jagdish has afield which is in the shape of a right angled triangle AQC. He wants to leave a space in the form of a square PQRS inside the field for growing wheat and the remaining for growing vegetables (as shown in the Fig.). In the field, there is a pole marked as O.

CBSE 2023



$PQ = \sqrt{(0-0)^2 + (200-(-200))^2}$

$= \sqrt{0 + (400)^2}$

$= \sqrt{(400)^2}$

$= 400$

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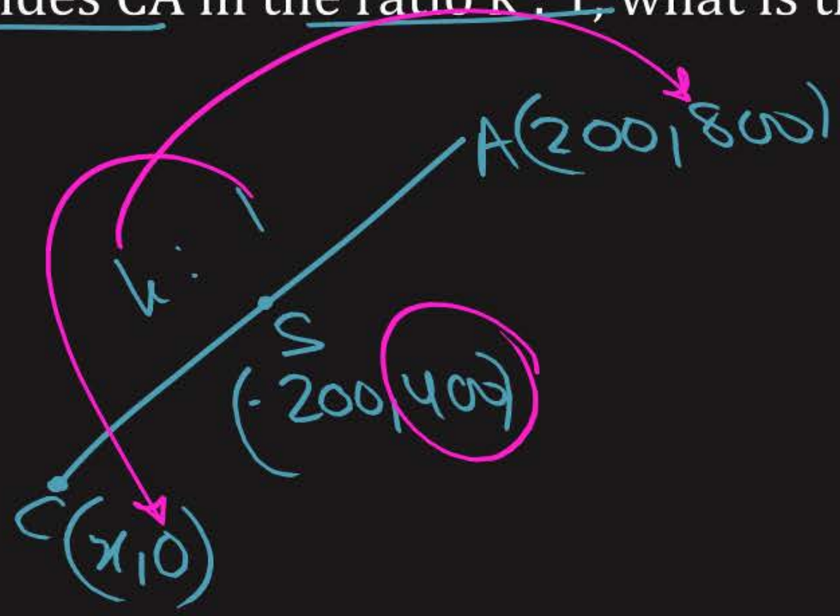
Based on the above, answer the following questions:

(i) Taking O as origin, coordinates of P are (– 200, 0) and Q are (200, 0). PQRS being a square, what are the coordinates of R and S?

(ii) What is the area of square PQRS? → $(s)^2 = (400)^2 = 160000$ sq. units

(iii) What is the length of diagonal PR in square PQRS? → $\sqrt{2}$(side) = $400\sqrt{2}$ units

(iv) If S divides CA in the ratio k : 1, what is the value of k, where point A is (200, 800)?



$400 = \frac{800k + 0}{k + 1}$

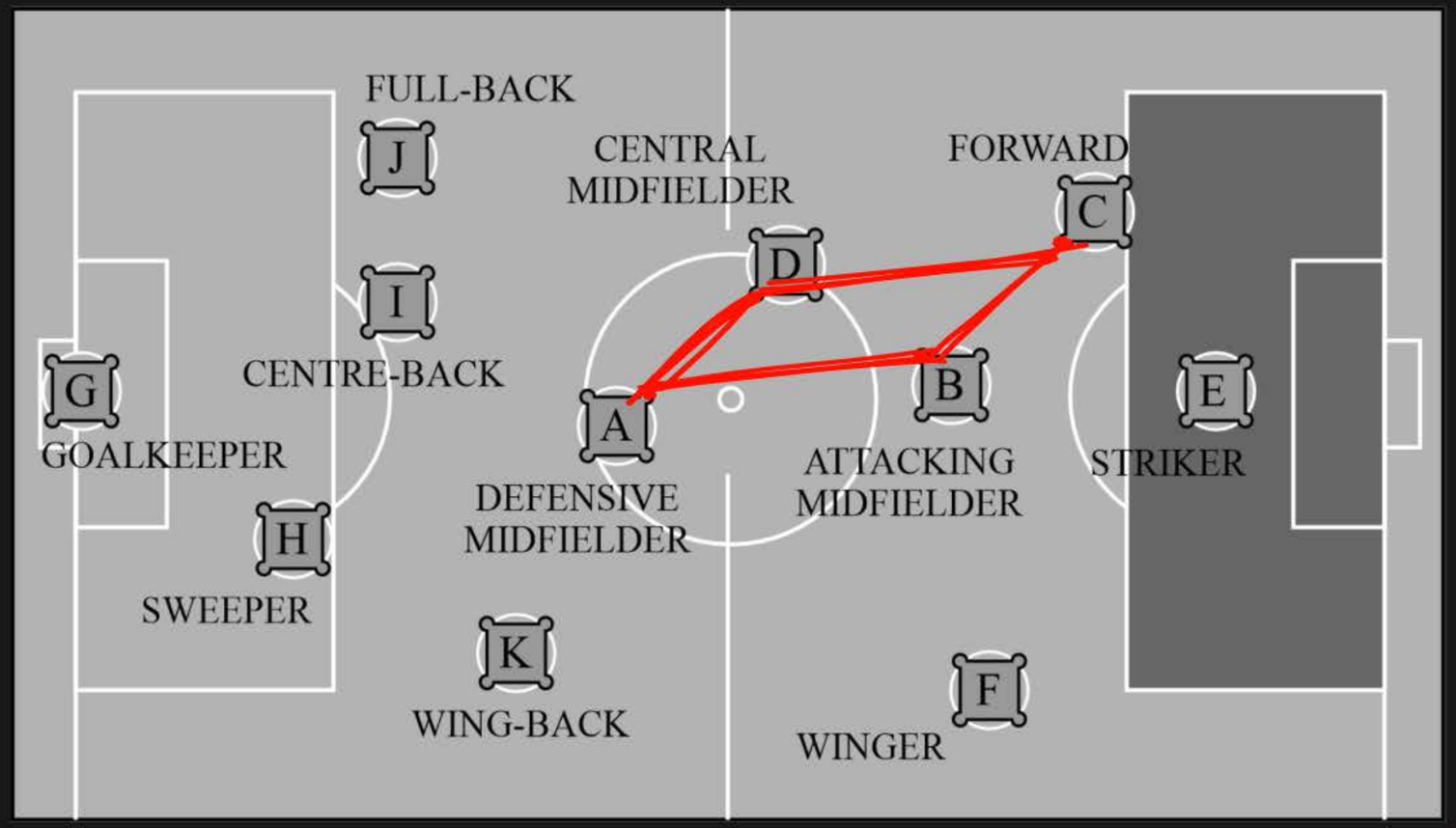
$400k + 400 = 800k$

$400 = 400k$

$1 = k$

#Q. Tharunya was thrilled to know that the football tournament is fixed with a monthly time frame from 20th July to 20th August 2023 and for the first time in the FIFA Women's World Cup's history, two nations host in 10 venues. Her father felt that the game can be better understood if the position of players represented as points on a coordinate plane.

CBSE SQP 2024



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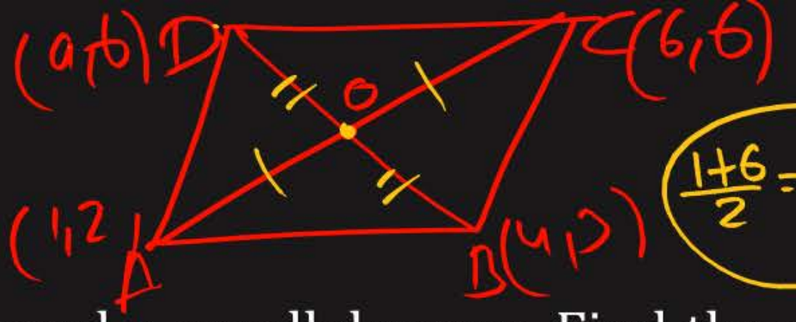


$\frac{1+6}{2} = \frac{a+4}{2}$

$\frac{2+6}{2} = \frac{b+3}{2}$

Based on the above, answer the following questions:

(i) At an instance, the mid fielders and forward formed a parallelogram. Find the position of the central mid fielder (D) if the position of other players who formed the parallelogram are: A(1, 2), B(4, 3), and C(6, 6).

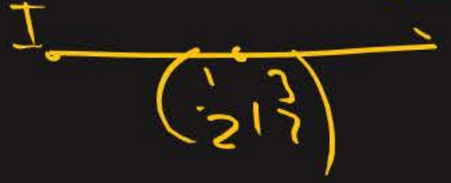
(ii) Check if the Goal keeper G(–3, 5), Sweeper H(3, 1) and Wing-back K(0, 3) fall on a same straight line.

(iii) Check if the Ful-back J(5, –3) and centre-back I(–4, 6) are equidistance from forward C(0, 1) and if C is the mid-point of IJ.

(iv) If Defensive mid fielder A(1, 4), Attacking mid fielder B(2, –3) and Striker E(a, b) lie on the same straight line and B is equidistance from A and E, find the position of E.

(ii) Collinear

(iii) CJ = CI



(iv)

#Q. In order to conduct sports day activities in your school, lines have been drawn with chalk power at a distance of 1 m each in a rectangular shaped ground ABCD, 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in the following figure. Niharika runs $\left(\frac{1}{4}\right)^{th}$ the distance AD on the 2nd line and posts a green flag. Preet runs $\left(\frac{1}{5}\right)^{th}$ distance AD on the eight line and posts a red flag. Taking A as the origin AB along x-axis and AD along y-axis, answer the following questions.

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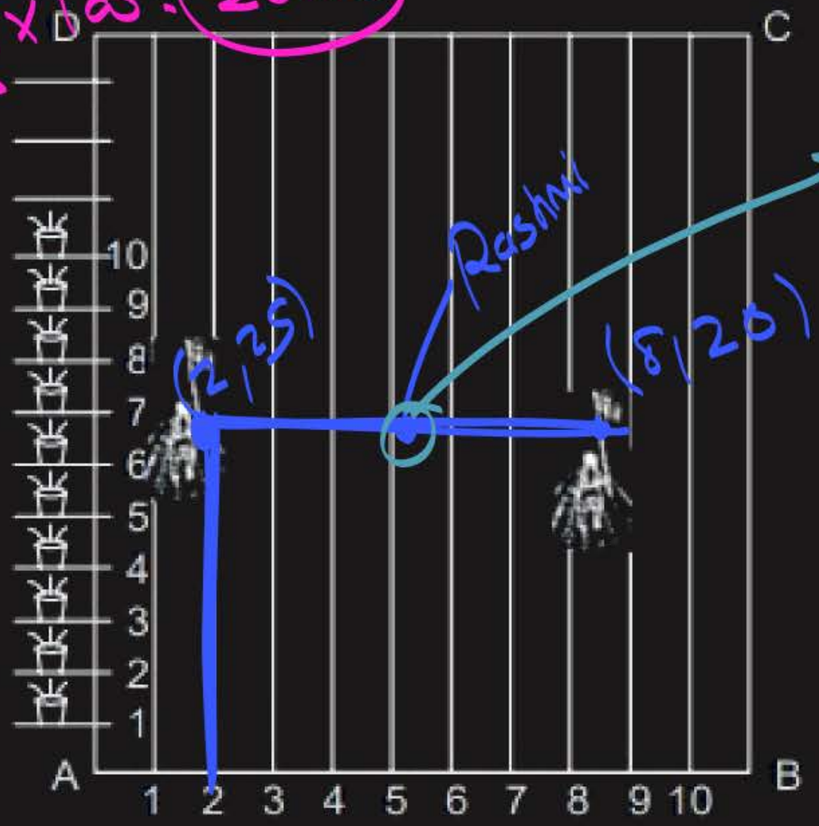
Nihaarika = $\left(\frac{1}{4}\right)^{m}$ distance = $\frac{1}{4} \times 100 =$ 25m

Preet = $\left(\frac{1}{5}\right)^{m}$ distance = $\frac{1}{5} \times 100 =$ 20m



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Based on the above, answer the following questions:

(i) The coordinates of the green flag are:

(a) (2, 25) (b) (2, 0.25) (c) (25, 2) (d) (0, –25)

(ii) The coordinates of the red flag are:

(a) (8, 0) (b) (20, 8) (c) (8, 20) (d) (8, 0.2)

(iii) The distance between the two flags is:

(a) $\sqrt{45}$ m (b) $\sqrt{11}$ m (c) $\sqrt{61}$ m (d) $\sqrt{51}$ m

(iv) 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?

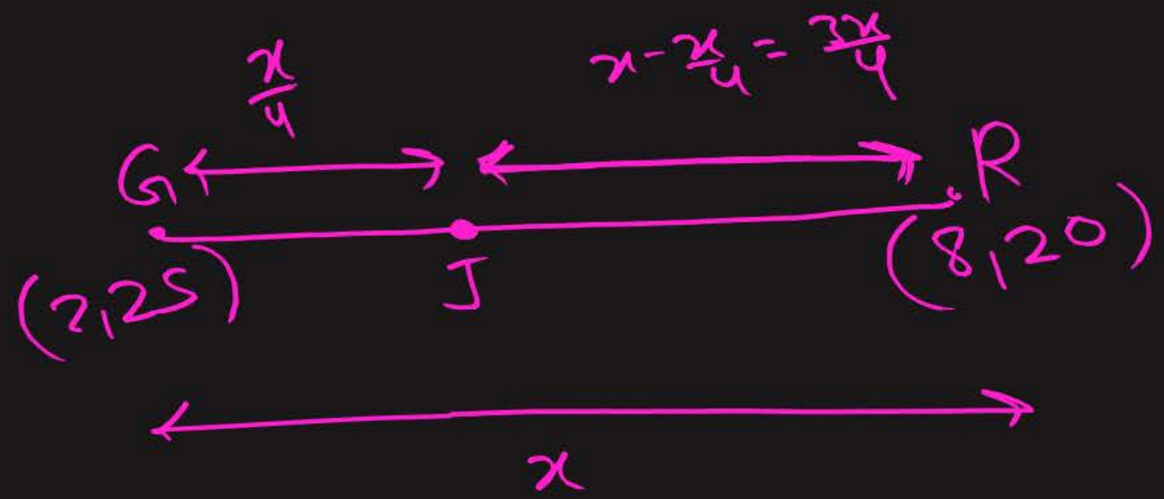
(a) (5, 22.5) (b) (10, 22) (c) (2, 8.5) (d) (3.5, 23.75)

(v) If Joy has to post a flag at 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)

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

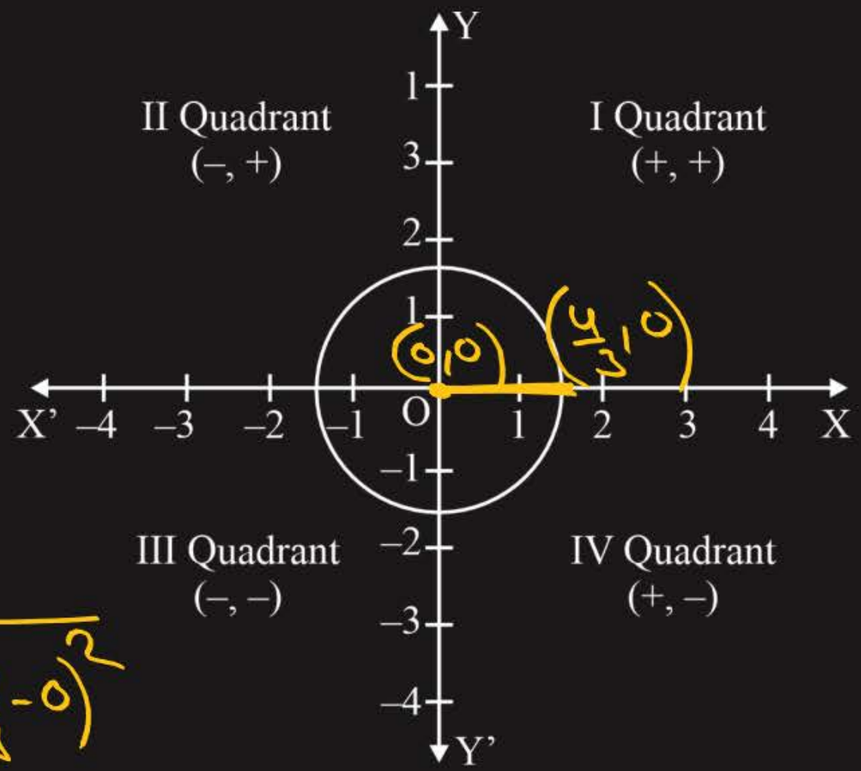
(a) (2, 25) (b) (8, 20) (c) (3.5, 24) (d) (3.5, 23.75)



$\frac{GJ}{JR} = \frac{x/4}{3x/4} = \frac{1}{3}$

#Q. A round clock is traced on a graph paper as shown below. The boundary intersect the coordinate axis at a distance of 4/3 units from origin.

x-axis
y-axis



$$\text{Radius} = \sqrt{(0-0)^2 + \left(\frac{4}{3}-0\right)^2}$$

$$= \frac{4}{3}$$

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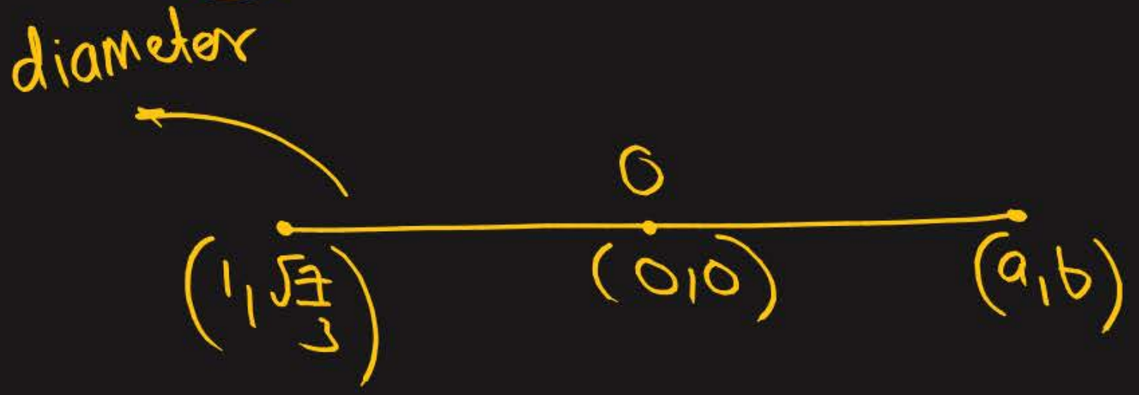
Based on the above, answer the following questions:

(i) Find the area of the circle. → $\pi r^2 = \frac{22}{7} \times \frac{4}{3} \times \frac{4}{3} =$ ○ sq. units.

(ii) If $\left(1, \frac{\sqrt{7}}{3}\right)$ is one of the ends of a diameter, then find its other end.



#Q. Raycasting is a technique used in the creation of computer games. The basic idea of raycasting is as follows: the map is a 2D square grid. Using rays generated from an object, this 2D map can be transformed into a 3D perspective. One of the methods involves sending out a ray from the player's location. To determine how far he/she is from a wall or an obstacle, the distance between the player's coordinates and the coordinate of the wall is calculated. If the player is near the obstacle, it looks larger and vice-versa.

#GPU

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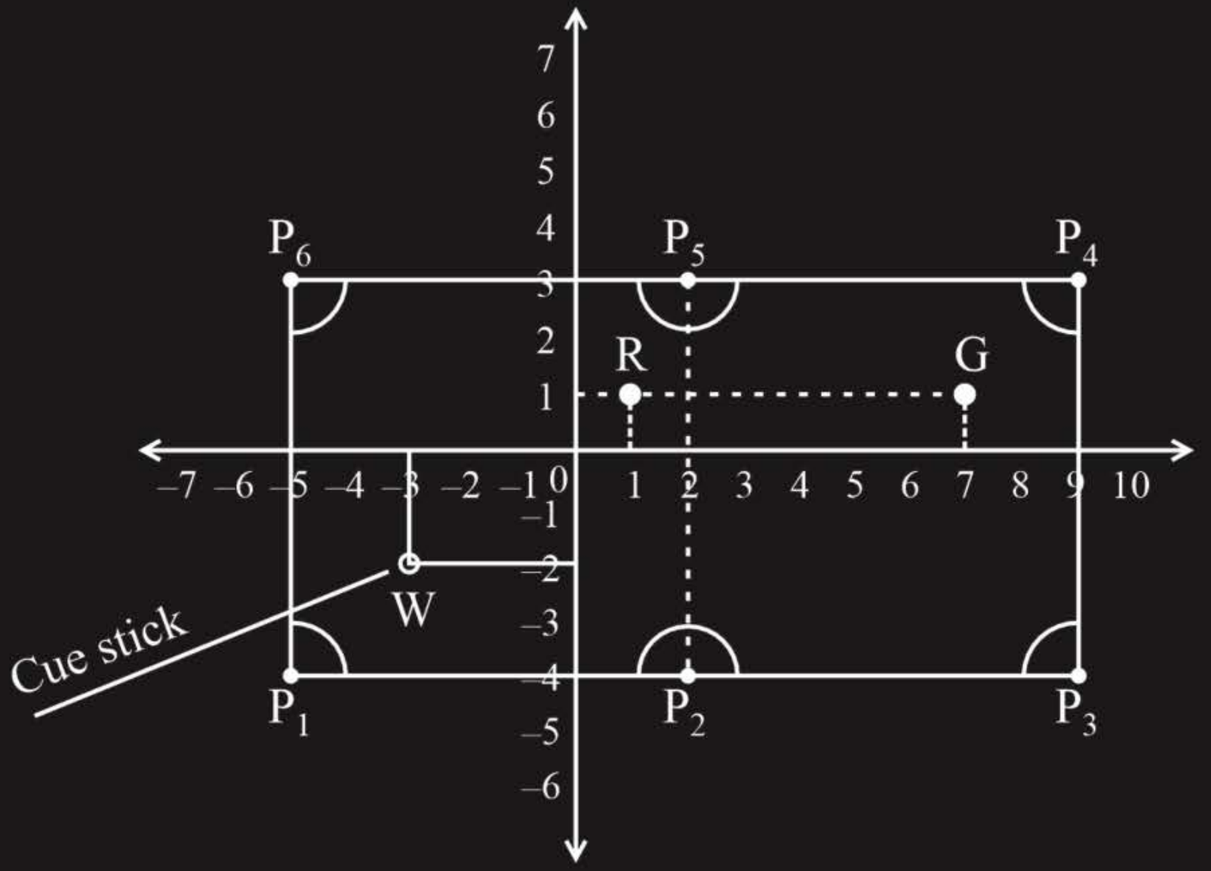
Shown image is a game, Wolf 3D, which was created using raycasting.

Riju wants to create an online snooker game using raycasting. The game in the creation stage on a coordinate map is shown below.



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The snooker table has six pockets (P_1, P_2, P_3, P_4, P_5, and P_6) and he has shown three balls- white (W), red (R) and green (G) on the table. The objective of the game is to use the white ball to hit the coloured balls into the pockets using a cue stick.

Based on the above, answer the following questions:

(i) How much distance will a ray travel if sent from the green ball to the nearest pocket? Show your work.

(ii) Riju wants to place a yellow ball at the midpoint of the line connecting the white and green balls.

Find the coordinates of the point at which he should place the yellow ball. Show your steps.

Continue to Next Slide…

#GPU

(iii) Riju is running a trial on his game. He struck the white ball in such a way that it rebound off the rail (line connecting P_4 and P_6) and went into the pocket P_2.

- After the rebound, the ball crossed the x-axis at point X $\left(\frac{2}{7}, 0\right)$ on the way to the pocket.
- The ratio of the distance between the rail and point X and the distance between point X and the pocket was 3 : 4.

Find the coordinates of the point at which the ball struck the rail. Show your steps.

OR

Riju wants to place a blue ball exactly halfway between the yellow ball at point (–1, 2) and the green ball at point (5, –4)

Find the coordinates of the point where he should place the blue ball. Show your steps.

Homework From Question Bank

Page 159 – Very short answer - 9, 10

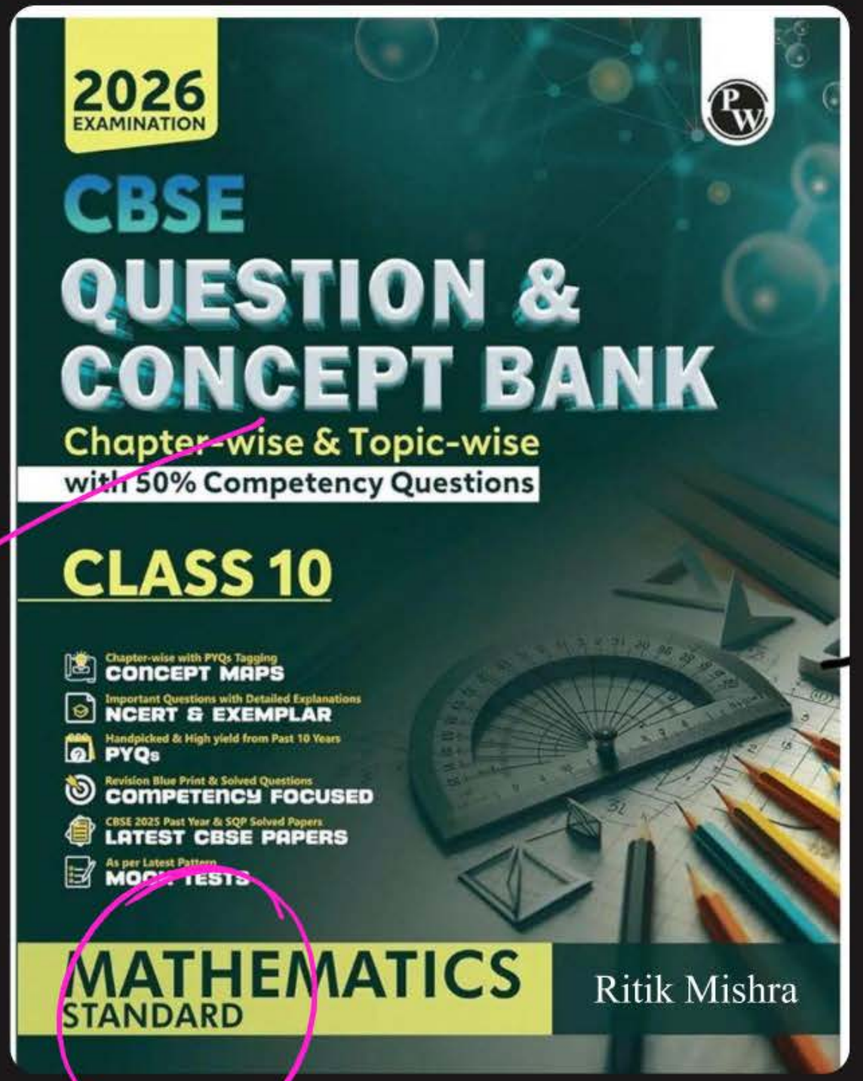
Short answer - 3, 4, 9

Page 160 – Long answer - 5, 6

Page 161 – Case based 5

A.P

Available on PW Store, Amazon, Flipkart



9. The sum of the first two terms of an arithmetic progression is the same as the sum of the first seven terms of the same arithmetic progression.

Can such an arithmetic progression exist? Justify your answer. **(CBSE CFPQ, 2023)**

10. A school auditorium has to be constructed with chairs arranged in a concave shape facing towards the stage. Each succeeding row has 5 more seats than the previous one, starting with 15 seats in the first row. For a particular event, a total of 1250 guests were present in the auditorium. Given that the auditorium has a total of 30 rows, how many rows will be left blank?

5. The sum of first and eighth terms of an A.P. is 32 and their product is 60. Find the first term and common difference of the A.P. Hence, also find the sum of its first 20 terms.

(CBSE DL, 2024)

6. In an A.P. of 40 terms, the sum of first 9 terms is 153 and the sum of last 6 terms is 687 . Determine the first term and common difference of A.P. Also, find the sum of all the terms of the A.P. **(CBSE DL, 2024)**

3. If first term of an AP is 5 and the sum of its first four terms is half the sum of the next four terms, then find the common difference of AP.

4. A positive integer has three digits, which are in AP and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

9. Find the largest negative term of the sequence 20, $19\frac{1}{4}$, $18\frac{1}{2}$, $17\frac{3}{4}$, ...

Case Based-V: An interior designer, Sana, hired two painters, Manan and Bhima to make paintings for her buildings. Both painters were asked to make 50 different paintings each.

The prices quoted by both the painters are given below:

- Manan asked for ₹6000 for the first painting, and an increment of ₹200 for each following painting.
- Bhima asked for ₹4000 for the first painting, and an increment of ₹400 for each following painting.

(CBSE APQ, 2023)

Answer the questions based on the given information.

(*i*) How much money did Manan get for his 25th painting? Show your work.

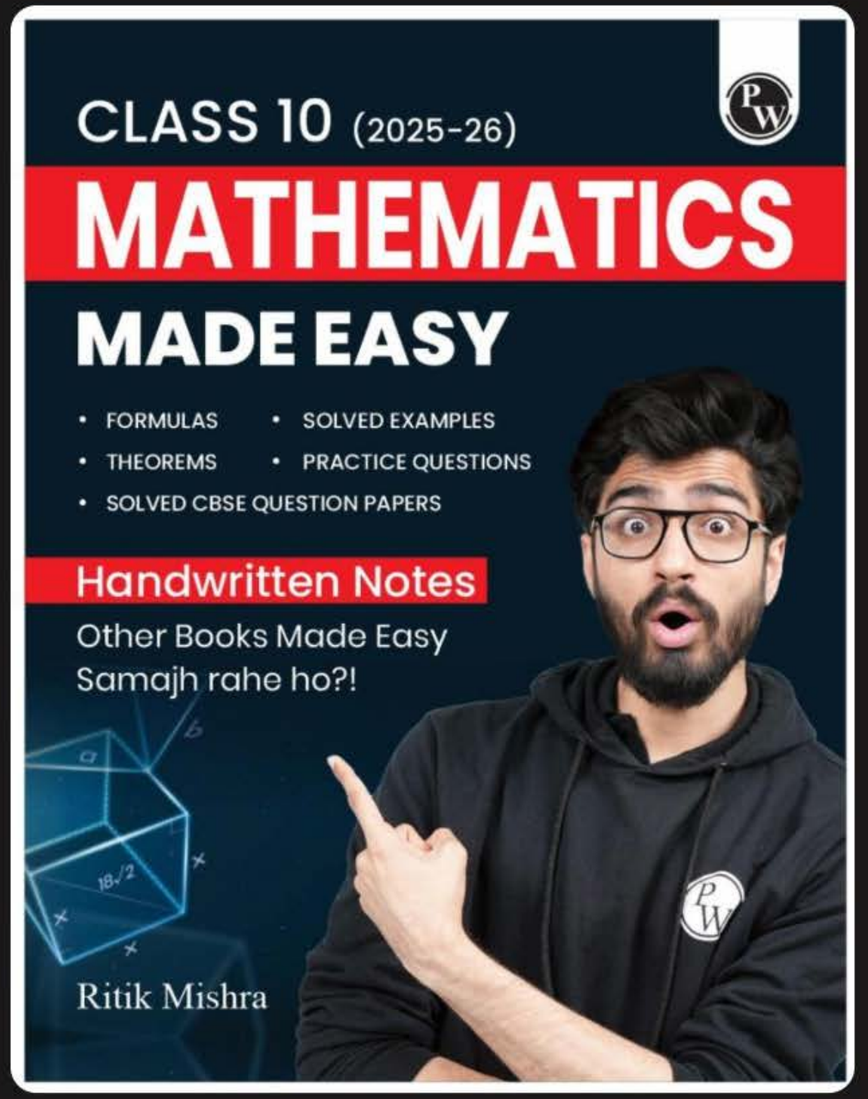
(*ii*) How much money did Bhima get in all? Show your work.

(*iii*) If both Manan and Bhima make paintings at the same pace, find the first painting for which Bhima will get more money than Manan. Show your steps.

OR

Sana's friend, Aarti hired Manan and Bhima to make paintings for her at the same rates as for Sana. Aarti had both painters make the same number of paintings, and paid them the exact same amount in total.

How many paintings did Aarti get each painter to make? Show your work.




WORK HARD
DREAM BIG
NEVER GIVE UP

RITIK SIR

JOIN MY OFFICIAL TELEGRAM CHANNEL

Thank You Babuaas❤️🫂

Thank You