UDAAN

2026

Coordinate Geometry

MATHS LECTURE-4

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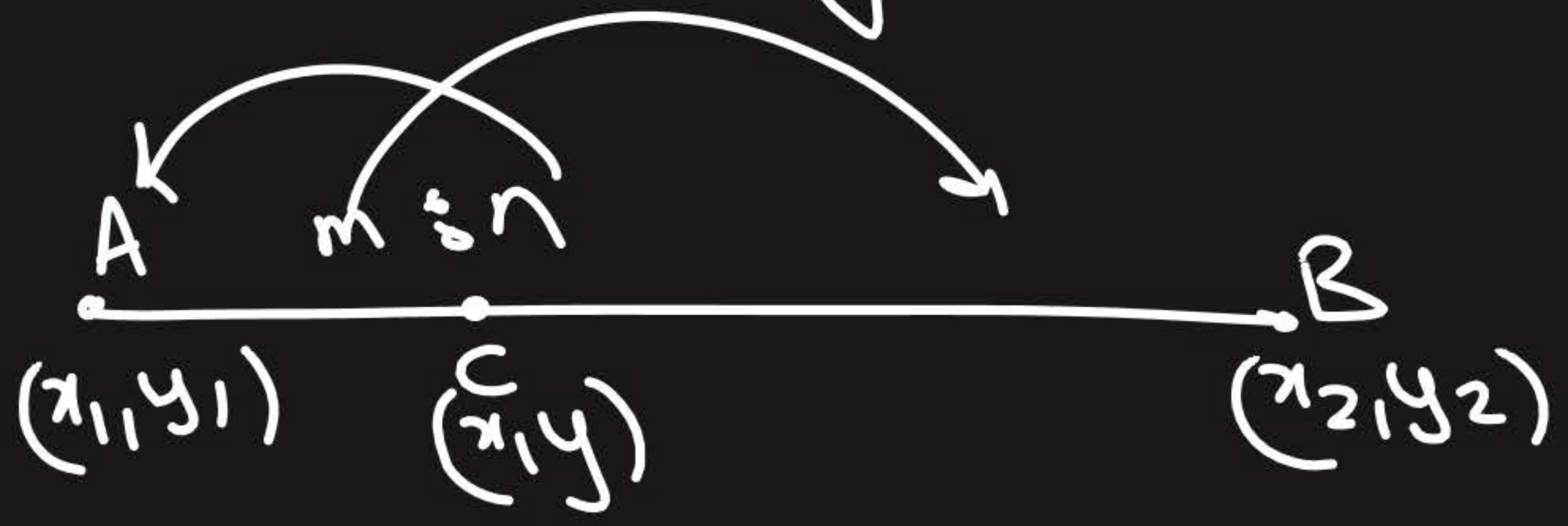
Topics *to be covered*

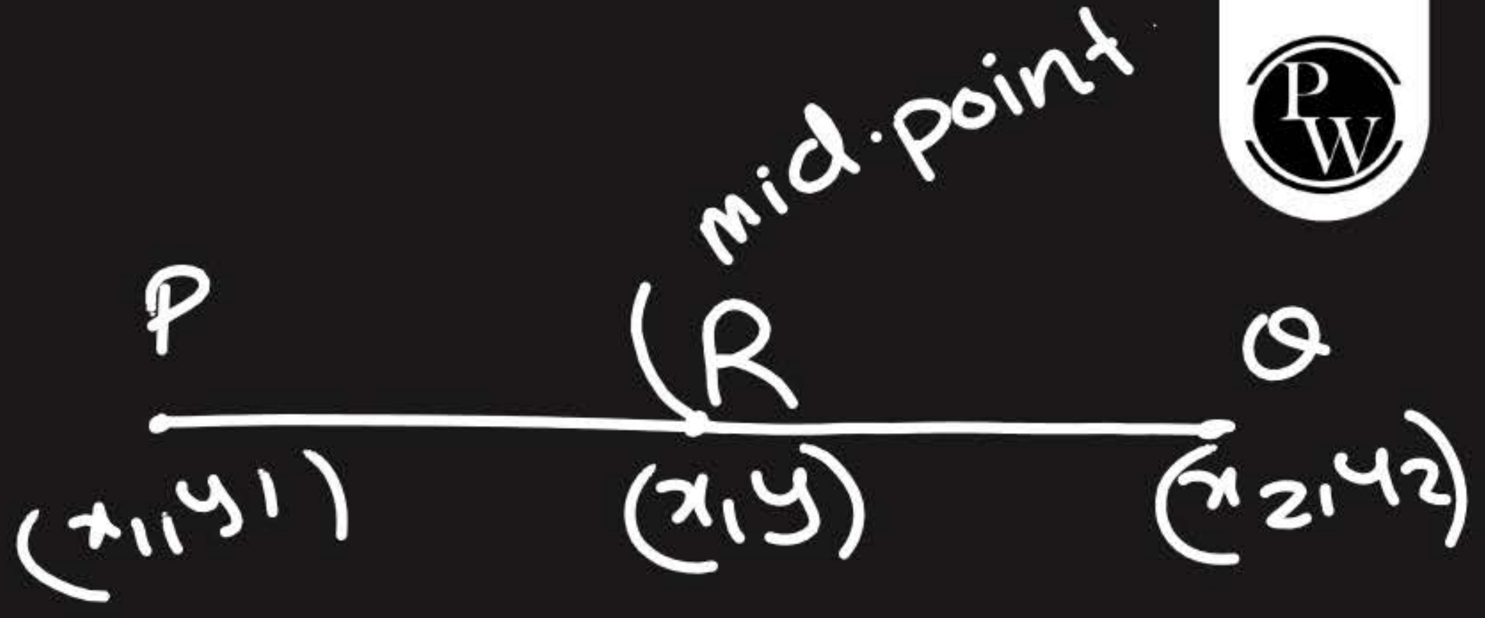
Questions

Section formula.



$$\boxed{x = \frac{mx_2 + nx_1}{m+n}}$$

$$\boxed{y = \frac{my_2 + ny_1}{m+n}}$$



$$\boxed{\begin{aligned} x &= \frac{x_1 + x_2}{2} \\ y &= \frac{y_1 + y_2}{2} \end{aligned}}$$

→ Ratio nahi diya hai → $k:1$

→ x-axis → $(x, 0)$

→ y-axis → $(0, y)$

#Q. Find the ratio in which the y-axis divides the line segment joining the points (5, –6) and (–1, –4). Also, find the coordinates of the point of division.

CBSE 2006, 10, 16, 19, 23

A) $1:5, (0, -11/3)$

B) $5:1, (0, -13/3)$

C) $3:1, (0, -5/2)$

D) $4:1, (0, -7/2)$

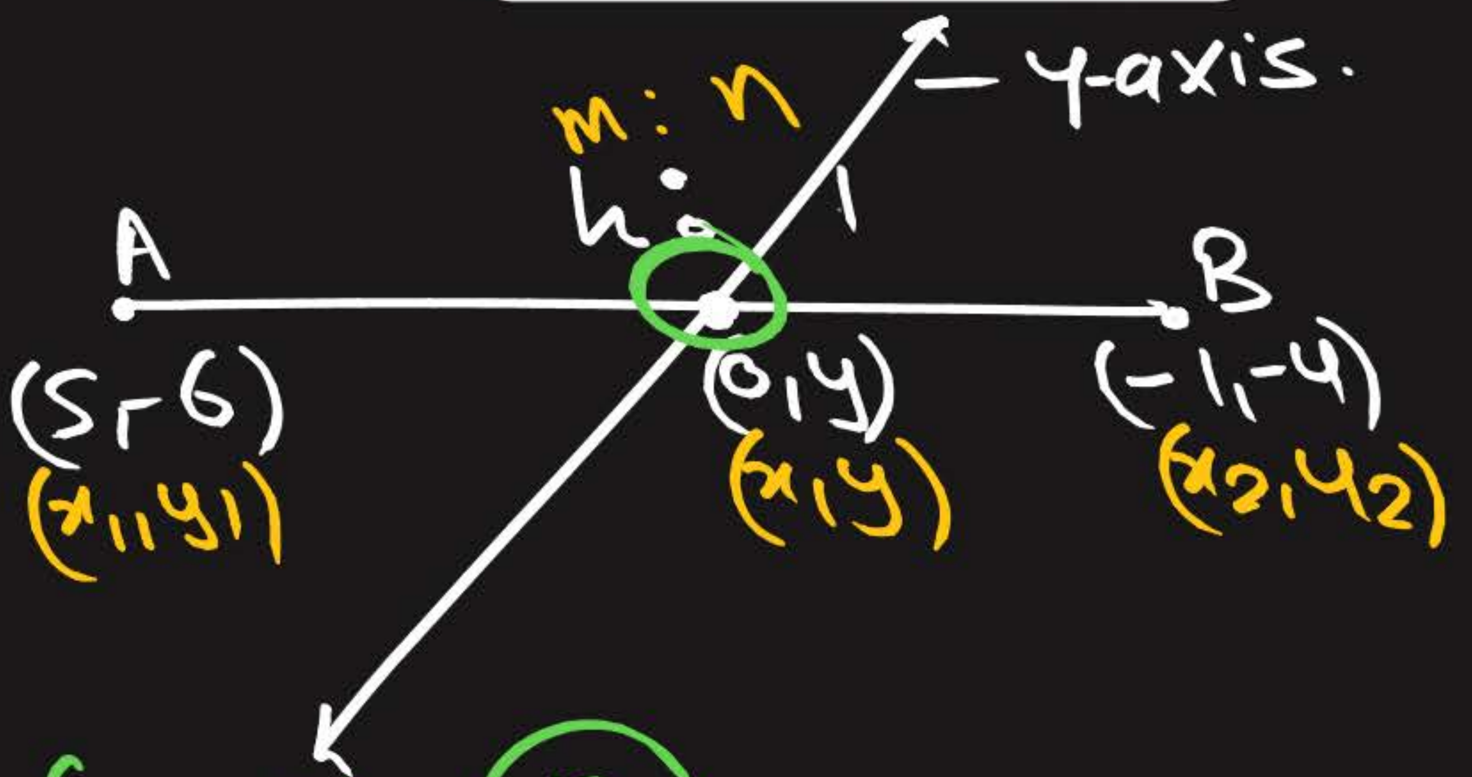
$$\boxed{x = \frac{mx_2 + nx_1}{m+n}}$$

$$0 = \frac{-k+5}{k+1}$$

$$0 = -k+5$$

$$\boxed{k=5}$$

$$y = \frac{-4k-6}{k+1} = \frac{-20-6}{6} = \frac{-26}{6} = \frac{-13}{3}$$



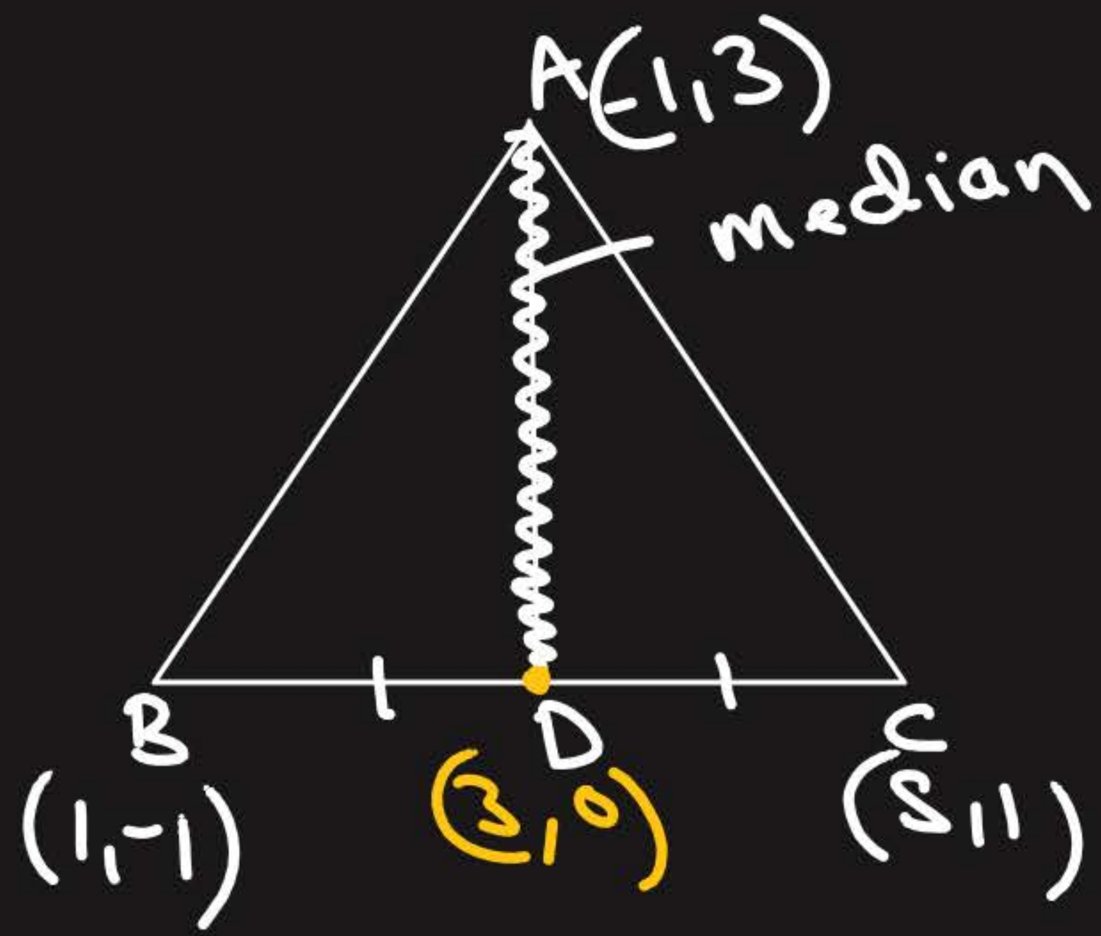
#Q. Find the ratio in which the line segment joining (−2, −3) and (5, 6) is divided by (i) x-axis (ii) y-axis.
Also, find the coordinates of the point of division in each case.

CBSE 2013, 14

#GPK

#Q. If A (–1,3), B (1, –1) and C (5, 1) are the vertices of a triangle ABC, find the length of the median through A.

$$AD = \sqrt{(0-3)^2 + (3 - -1)^2}$$
$$= \sqrt{9+16}$$
$$= \sqrt{25}$$
$$= 5$$



A 2

B 3

C 4

D 5

#Q. Find the coordinates of the point where the diagonals of the parallelogram formed by joining the points (–2, –1), (1, 0), (4, 3) and (1, 2) meet.

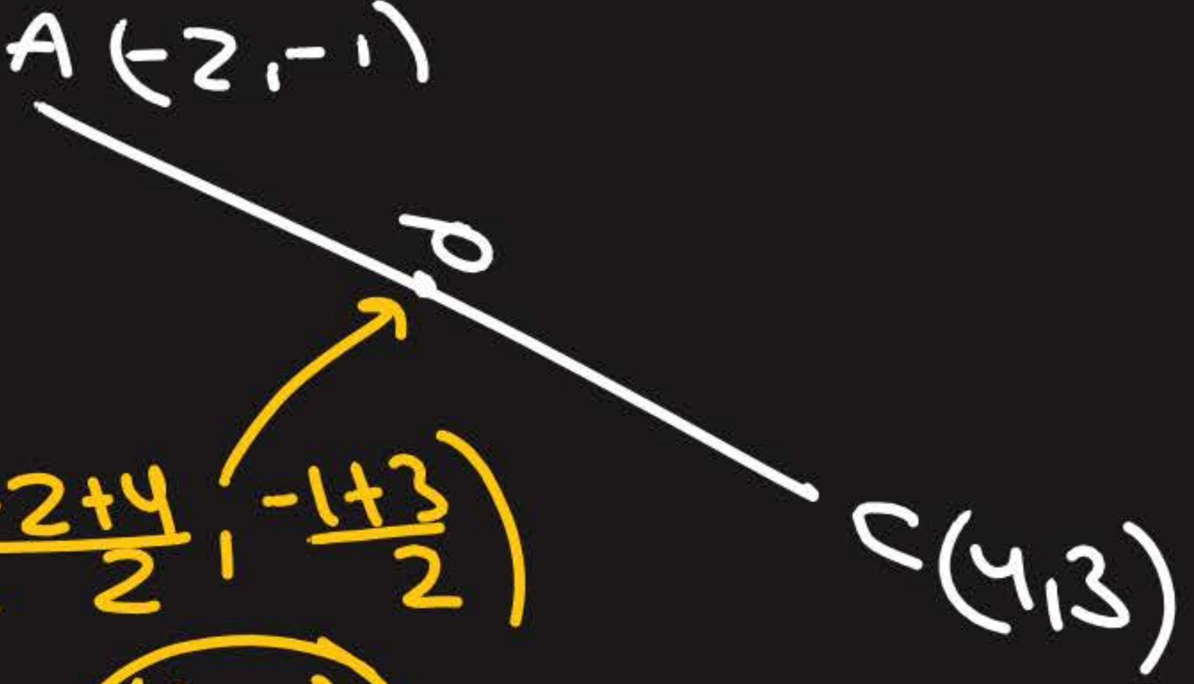
(A) (1, 1)

(B) (2, 2)

(C) (–1, 0)

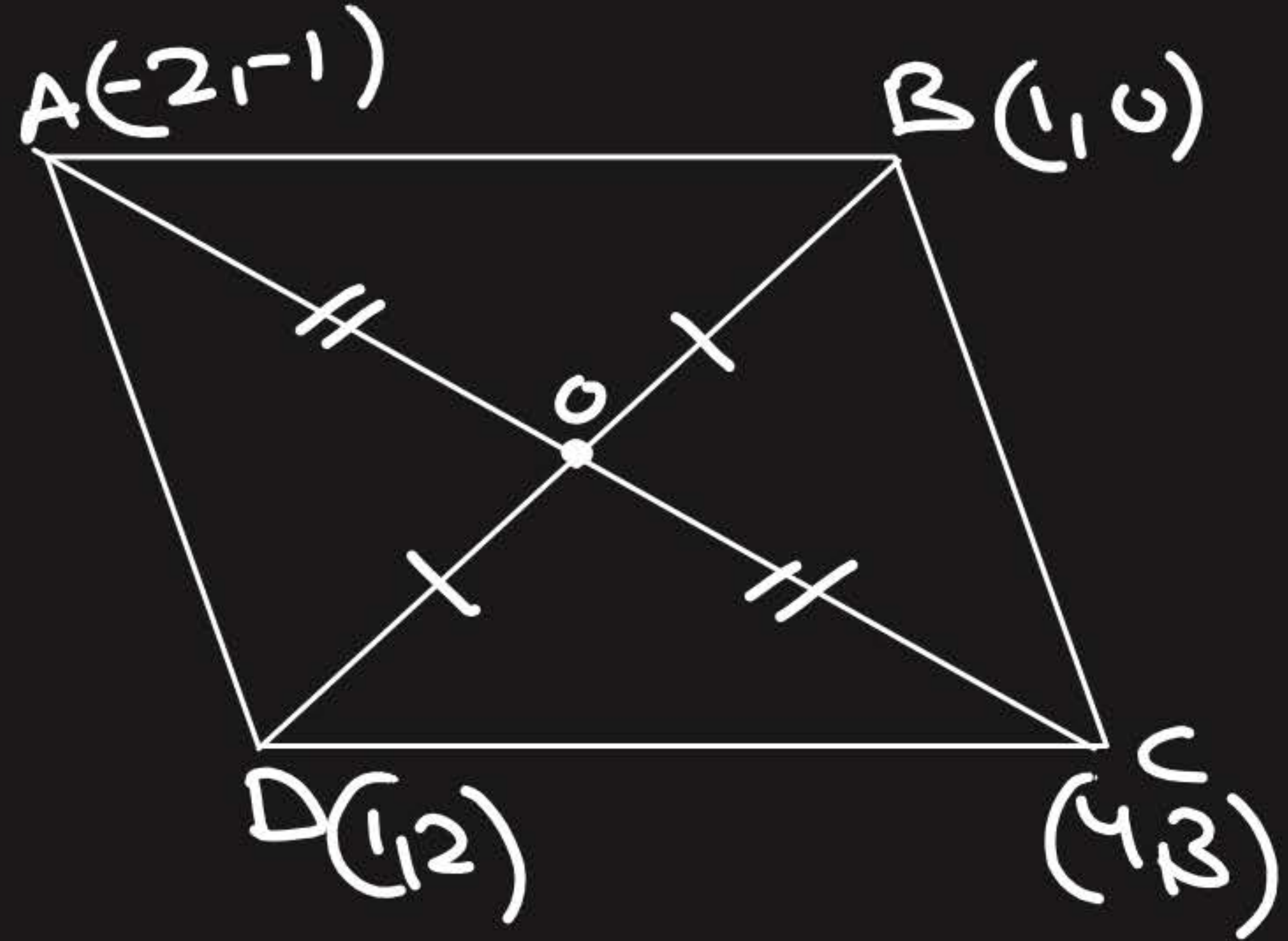
(D) (3, 2)

diagonals of a llgm bisect each other.



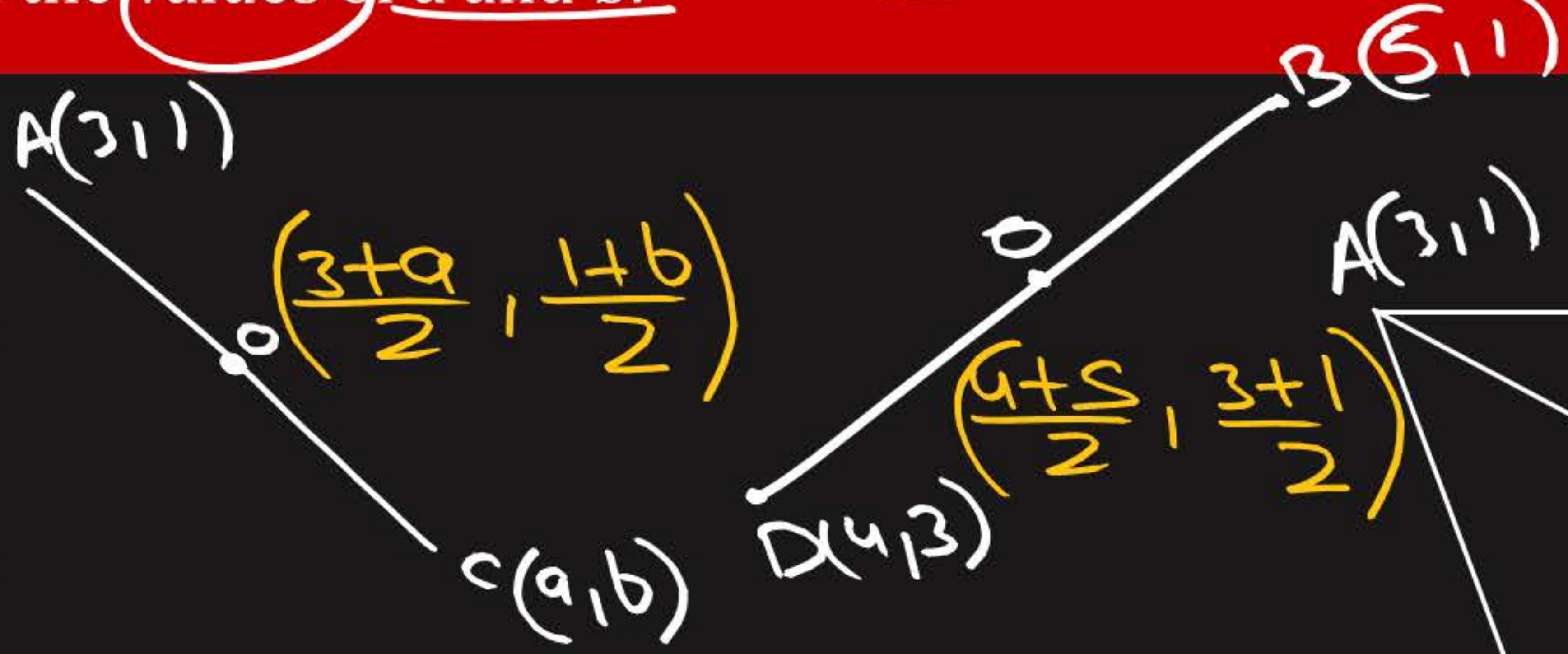
$\left(\frac{-2+4}{2}, \frac{-1+3}{2}\right)$

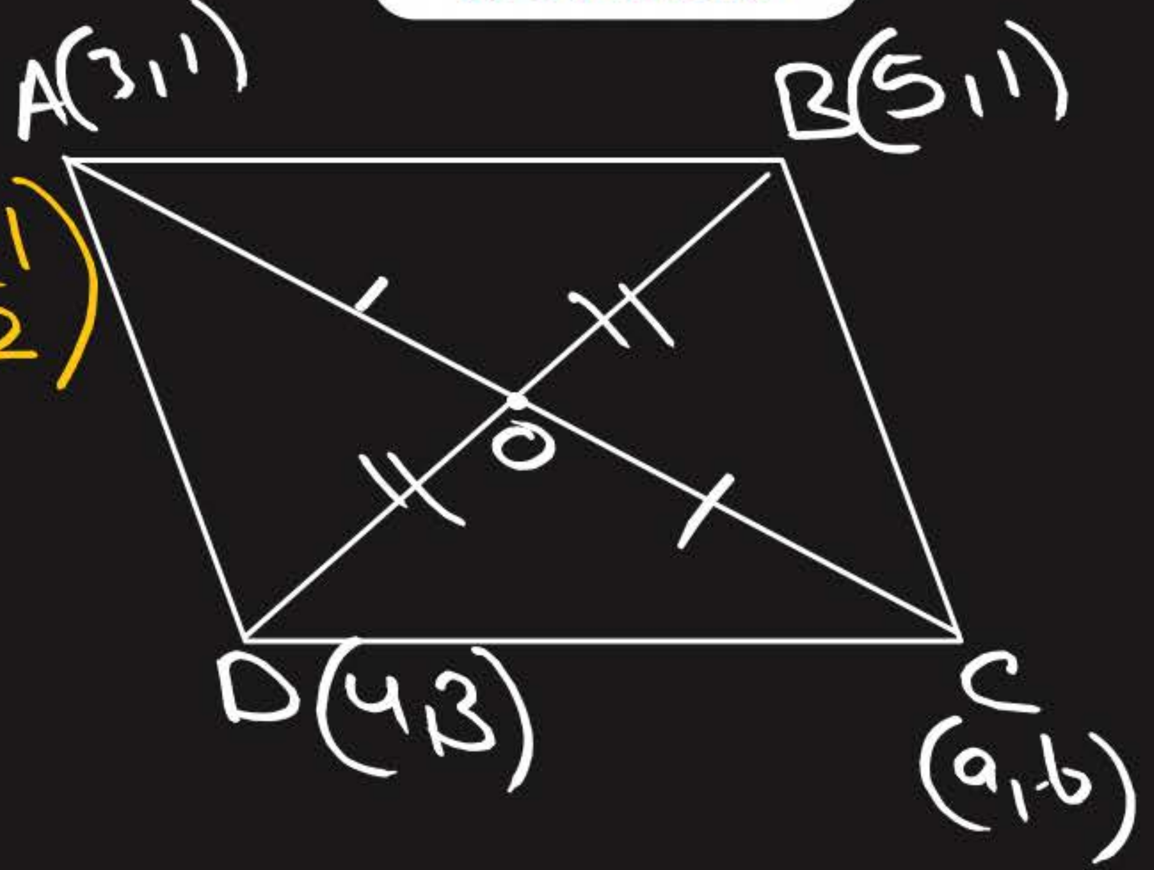
(1, 1)



#Q. Points A (3, 1), B (5, 1), C (a, b) and D (4, 3) are vertices of a parallelogram ABCD. Find the values of a and b.

CBSE 2019





(A) $a = 4, b = 3$

(B) $a = 6, b = 3$

(C) $a = 6, b = 1$

(D) $a = 5, b = 2$

$\Rightarrow \frac{3+a}{\cancel{2}} = \frac{4+5}{\cancel{2}}, \quad \frac{1+b}{\cancel{2}} = \frac{3+1}{2}$

$3+a=9, \quad 1+b=4$

$a=6, \quad b=3$

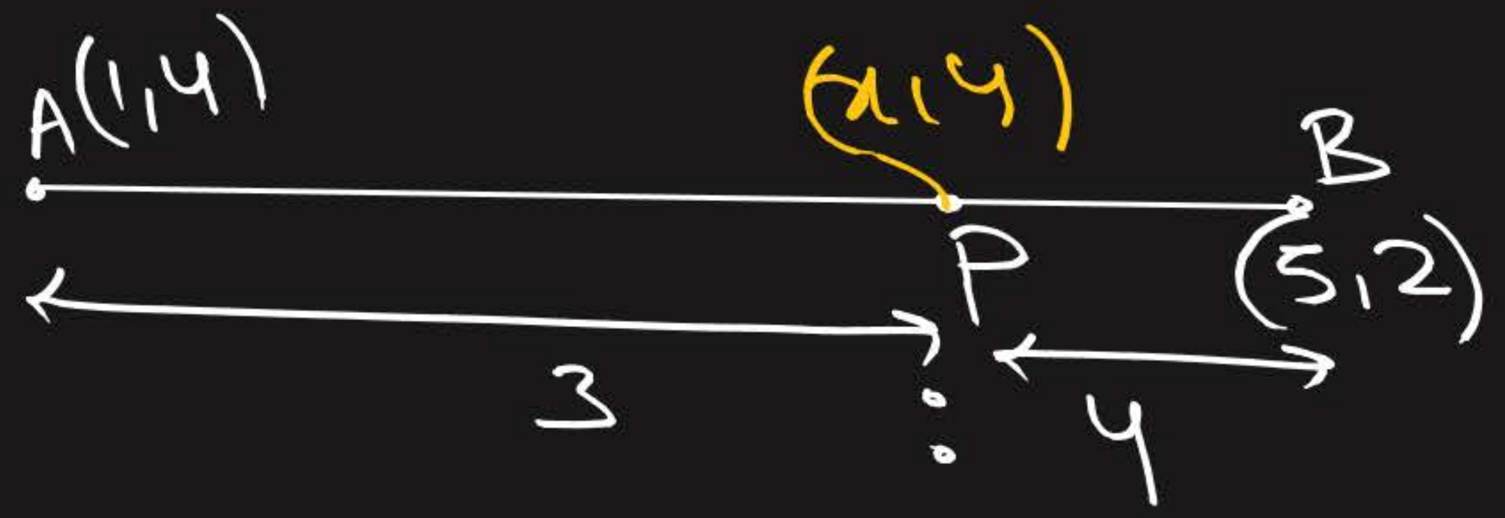
#Q. If A and B are (1, 4) and (5, 2) respectively, find the coordinates of P when AP/BP = 3/4.

(A) (19/7, 22/7)

(B) (17/7, 20/7)

(C) (18/7, 23/7)

(D) (20/7, 21/7)



$$x = \frac{15+4}{7} = \frac{19}{7}$$

$$y = \frac{6+16}{7} = \frac{22}{7}$$

#Q. Find the coordinate of the point R on the line segment joining the points P(–1, 3) and Q(2, 5) such that PR = $\frac{3}{5}$ PQ.

(A) (4/5, 21/5)

(B) (3/5, 19/5)

(C) (2/5, 17/5)

(D) (1, 4)

$$\frac{PR}{PQ} = \frac{3}{5}$$

$$\boxed{\frac{PR}{RQ} = \frac{3}{2}}$$

P(-1,3) R Q (2,5)

M.I

$$\frac{PR}{PR+RQ} = \frac{3}{5}$$

$$5PR = 3PR + 3RQ$$

$$5PR - 3PR = 3RQ$$

$$2PR = 3RQ$$

M.II

$$\frac{PR}{PQ} = \frac{3}{5}$$

Let, $PR = 3k$

$PQ = 5k$

$RQ = PQ - PR$

$= 5k - 3k$

$= 2k$

$$\boxed{\frac{PR}{RQ} = \frac{3k}{2k}}$$

#Q. If A and B are two points having coordinates (–2, –2) and (2, –4) respectively, find the coordinates of P such that $AP = \frac{3}{7} AB$.

CBSE 2008, 09

A (–2/7, –20/7)

B (2/7, –18/7)

C (–1/7, –19/7)

D (1/7, –20/7)

A(-2, -2) P B (2, -4)

$$\frac{AP}{AB} = \frac{3}{7}$$

#Q. If (a, b) is the mid-point of the line segment joining the points A (10, −6), B (k, 4) and a – 2b = 18, find the value of k and the distance AB.

#GPL

$$\boxed{a = \frac{10+k}{2}}$$

$$\boxed{b = \frac{-6+4}{2} = \frac{-2}{2} = -1}$$

$$a - 2b = 18$$

$$\frac{10+k}{2} - 2(-1) = 18$$

$$\frac{10+k}{2} + 2 = 18$$

$$\frac{10+k}{2} = 16$$

$$10+k = 32$$

$$k = 22$$

#Q. The line joining the points (2, 1) and (5, –8) is trisected at the points P and Q. If point P lies on the line $2x - y + k = 0$. Find the value of k.

CBSE 2005, 19

A) –6

B) 6

C) –8

D) 8

A(2, 1) P Q B(5, –8)

1 : 1 : 1

$\rightarrow 2x - y + k = 0$

3 equal part

A(2, 1) P B (5, –8)

1 : 2

$P_x = \frac{5+4}{3} = \frac{9}{3} = 3$

$P_y = \frac{-8+2}{3} = \frac{-6}{3} = -2$

Point P(3, –2) will satisfy the eqn $2x - y + k = 0$

$\therefore 2(3) - (-2) + k = 0$

$k = -8$

HOT

#Q. Find the ratio in which the line $2x + 3y - 5 = 0$ divides the line segment joining the points $(8, -9)$ and $(2, 1)$.

Also, find the coordinates of the point of division.

$$\boxed{x = \frac{2k+8}{k+1}}$$

$$\boxed{y = \frac{k-9}{k+1}}$$

(x, y) will satisfy the eqn of line.

A) $1 : 8, (8/9, -1/3)$

B) $7 : 2, (3, -1/2)$

C) $2 : 7, (16/9, -2/3)$

D) $8 : 1, (8/3, -1/9)$

$$2x+3y-5=0$$

$$2\left(\frac{2k+8}{k+1}\right)+3\left(\frac{k-9}{k+1}\right)=5$$

$$\frac{4k+16}{k+1}+\frac{3k-27}{k+1}=5$$

$$\frac{4k+16+3k-27}{k+1}=5$$

$$7k-11=5(k+1)$$

$$7k-11=5k+5$$

$$2k=16$$

$$k=8$$

$$\text{Ratio} \Rightarrow 8:1 \; //$$

#Q. A point P divides the line segment joining the points A (3, –5) and B (–4, 8) such that $\frac{AP}{PB} = \frac{k}{1}$. If P lies on the line x + y = 0, then find the value of k.

#GPK

CBSE 2012

A 1/2

B 2/3

C 3/4

D NOTA

Homework From Question Bank

Page 198 – Long Answer 4

Page 199 – Case based 1, Case based 3

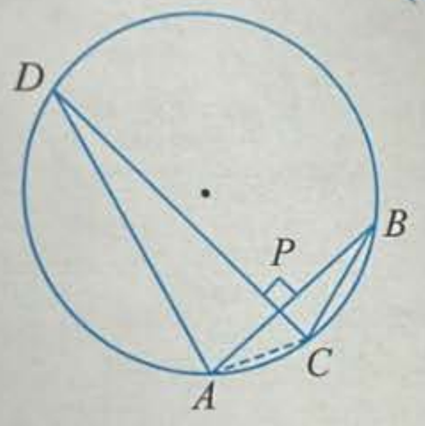
Page 200 – Case based 5

Page 195 – 4, 5

Page 194 – 4

4. AB and CD are two chords of a circle intersecting at P. Choose the correct statement from the following:

(CBSE ODL, 2024)

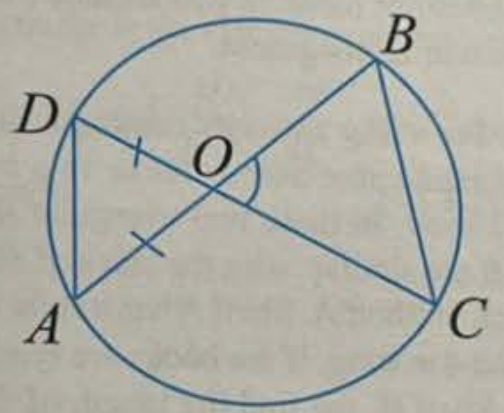


(*a*) $\Delta ADP \sim \Delta CBA$ (*b*) $\Delta ADP \sim \Delta BPC$

(c) $\Delta ADP \sim \Delta BCP$ (*d*) $\Delta ADP \sim \Delta CBP$

5. O is the point of intersection of two chords AB and CD of a circle.

(CBSE SQP, 2024)

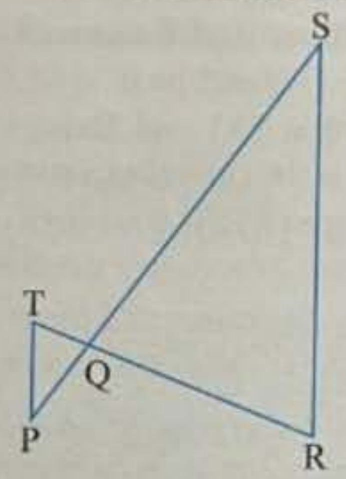


If $\angle BOC = 80°$ and $OA = OD$ then ΔODA and ΔOBC are

(*a*) equilateral and similar (*b*) isosceles and similar

(*c*) isosceles but not similar (*d*) not similar

4. In a mathematics class, a teacher drew the following figure where $\frac{TQ}{QR} = \frac{1}{3}$. She then asked, "What is the sufficient condition required to prove that $\Delta TQP \sim \Delta RQS$?"

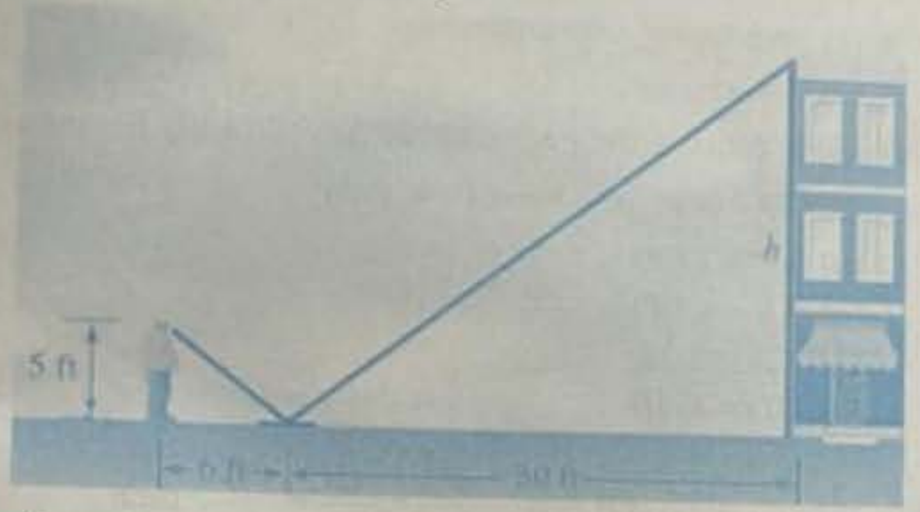


- Darsh said that it is sufficient if it is given that $\frac{TP}{SR} = \frac{1}{3}$.
- Bhargav said that it is sufficient if it is given that $\angle P = \angle S$.
- Tanvi said that it is sufficient if it is given that $\frac{PQ}{QS} = \frac{1}{3}$.

Examine whether each of their responses is correct or incorrect. Give reasons. **(CBSE CFPQ, 2023)**

4. **If AD and PM are medians of triangles ABC and PQR, respectively where $\Delta ABC \sim \Delta PQR$, prove that $\frac{AB}{PQ} = \frac{AD}{PM}$.**

Case Based-I: Aruna visited to her uncle's house. From a point A, where Aruna was standing, a bus and building come in a straight line as shown in the figure.



Based on the above information, answer the following questions.

(*i*) Which similarity criteria can be seen in this case, if bus and building are considered in a straight line?

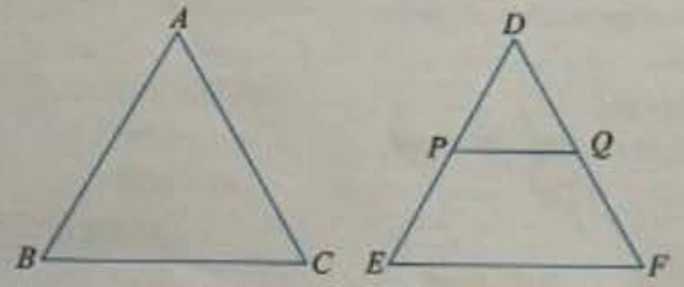
(*ii*) If the distance between Aruna and the bus is twice as much as the height of the bus, then find the height of the bus.

OR

If the distance of Aruna from the building is twelve times the height of the bus, then find the ratio of the heights of bus and building.

(*iii*) What is the ratio of the distance between Aruna and the top of the bus to the distance between the tops of the bus and the building?

Case Based-III:



Triangle is a very popular shape used in interior designing. The picture given above shows a cabinet designed by a famous interior designer. **(CBSE SQP, 2024)**

Here the largest triangle is represented by ΔABC and smallest one with shelf is represented by ΔDEF. PQ is parallel to EF.

(*i*) Show that $\Delta DPQ \sim \Delta DEF$.

(*ii*) If $DP = 50$ cm and $PE = 70$ cm then find $\frac{PQ}{EF}$.

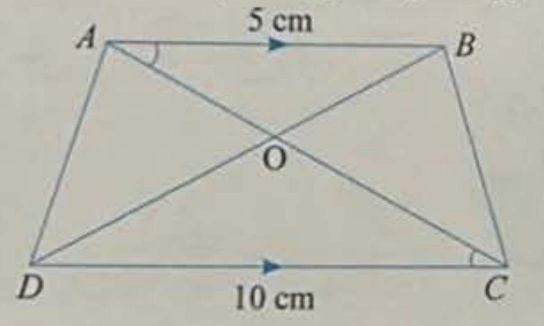
(*iii*) (*a*) If $2AB = 5DE$ and $\Delta ABC \sim \Delta DEF$ then show that $\frac{\text{perimeter of } \Delta ABC}{\text{perimeter of } \Delta DEF}$ is constant.

OR

(*iii*) (*b*) If AM and DN are medians of triangles ABC and DEF respectively then prove that $\Delta ABM \sim \Delta DEN$.

Case Based-V: A farmer has a field in the shape of trapezium, whose map with scale 1 cm = 20 m, is given below:

The field is divided into four parts by joining the opposite vertices.



Based on the above information, answer any four of the following questions: **(CBSE Term-I, 2022)**

(*i*) The two triangular regions AOB and COD are

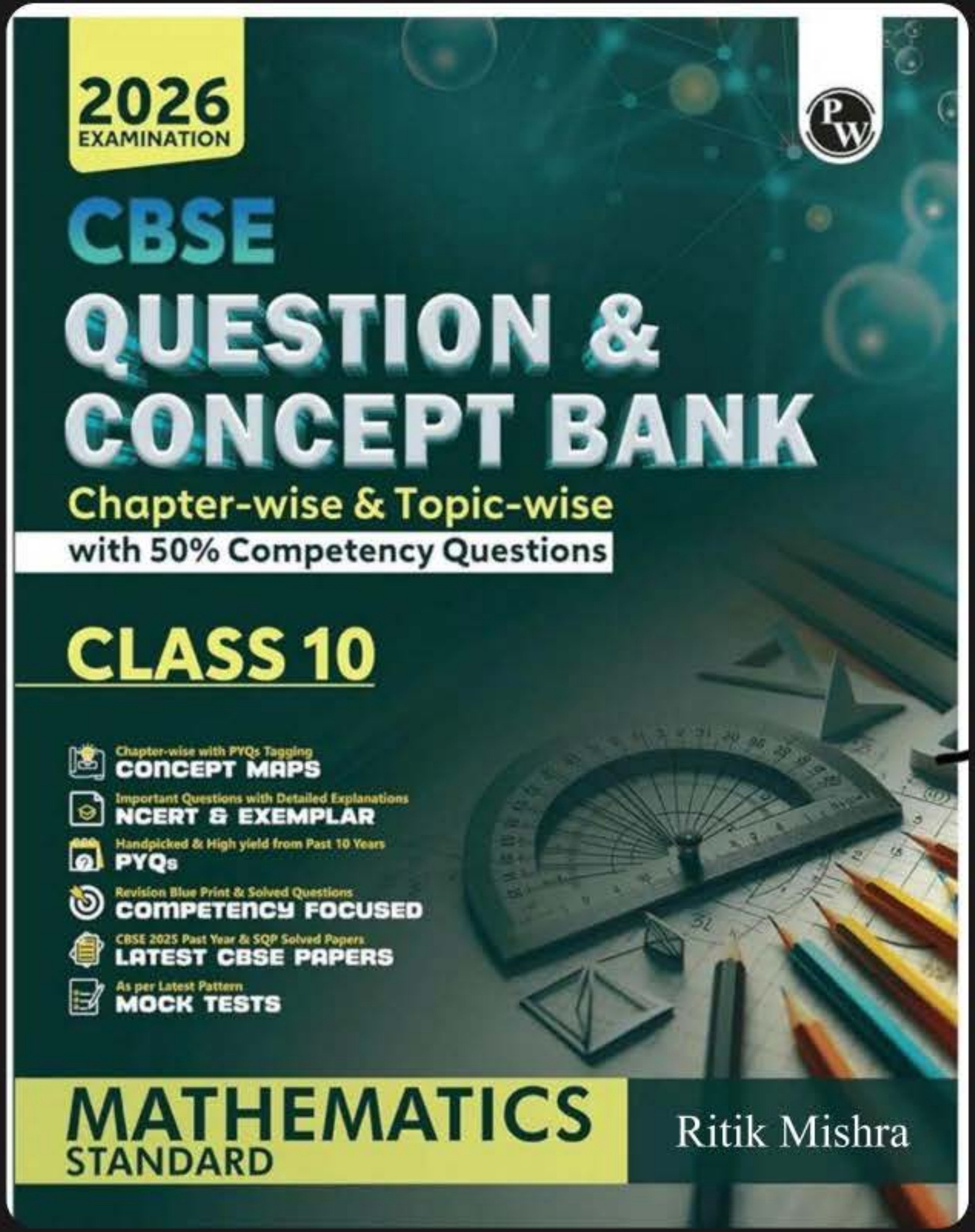
(*a*) Similar by *AA* criterion
(*b*) Similar by *SAS* criterion
(*c*) Similar by *RHS* criterion
(*d*) Not similar

(*ii*) If the ratio of the perimeter of ΔAOB to the perimeter of ΔCOD would have been 1 : 4, then

(*a*) $AB = 2\,CD$
(*b*) $AB = 4\,CD$
(*c*) $CD = 2\,AB$
(*d*) $CD = 4\,AB$

(*iii*) If in Δs AOD and BOC, $\frac{AO}{BC} = \frac{AD}{BO} = \frac{OD}{OC}$, then

(*a*) $\Delta AOD \sim \Delta BOC$ (*b*) $\Delta AOD \sim \Delta BCO$
(*c*) $\Delta ADO \sim \Delta BCO$ (*d*) $\Delta ODA \sim \Delta OBC$


2026
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