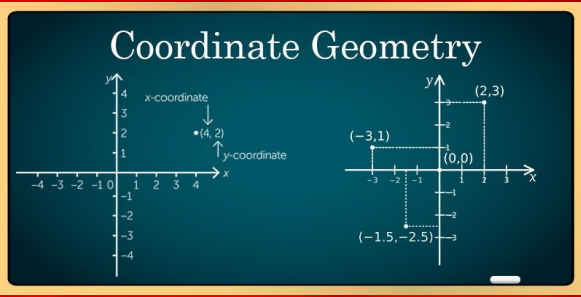

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Coordinate Geometry

Grade 10 , Topic: 5 , Maths : II

Topics

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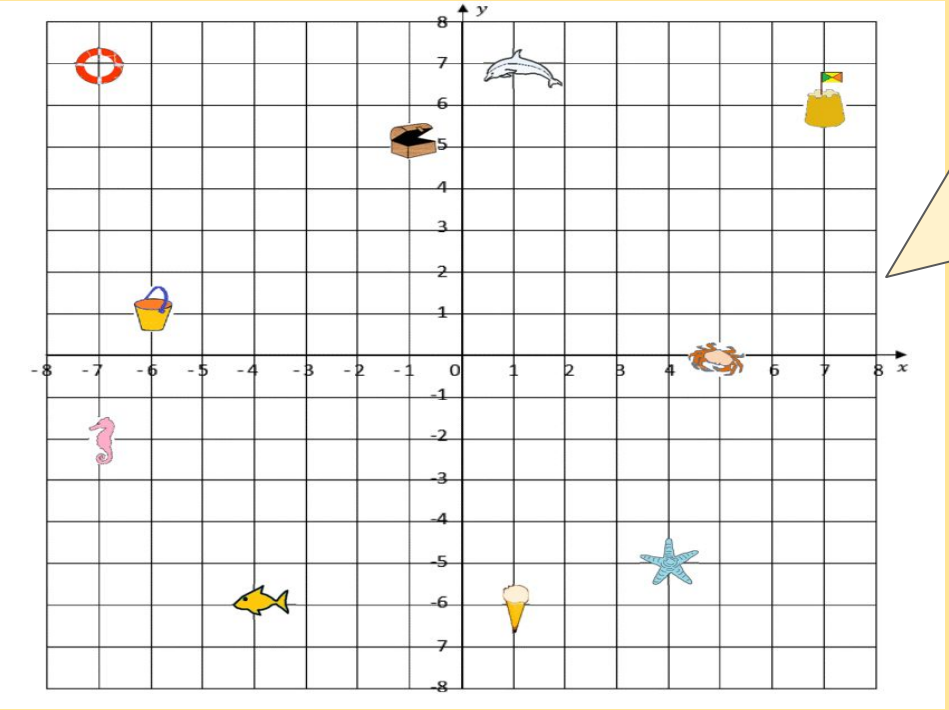
- Basics
- Sign convention of the quadrants
- Distance Formula
- Section Formula

Engage yourself ....



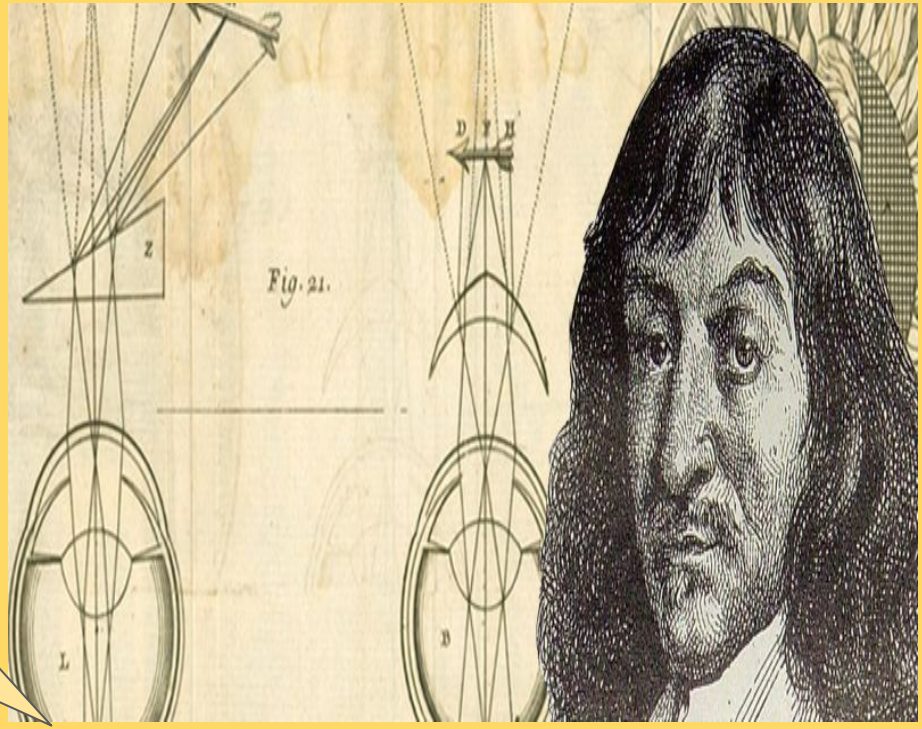
Write down the coordinates of :

1) The crab
2) The ice cream
3) The seahorse

Know more

https://www.storyofmathematics.com/17th_descartes.html
(Rene descartes)

It was in “La Géométrie” that Descartes first proposed that each point in two dimensions can be described by two numbers on a plane, one giving the point's horizontal location and the other the vertical location, which have come to be known as Cartesian coordinates.



Understand it

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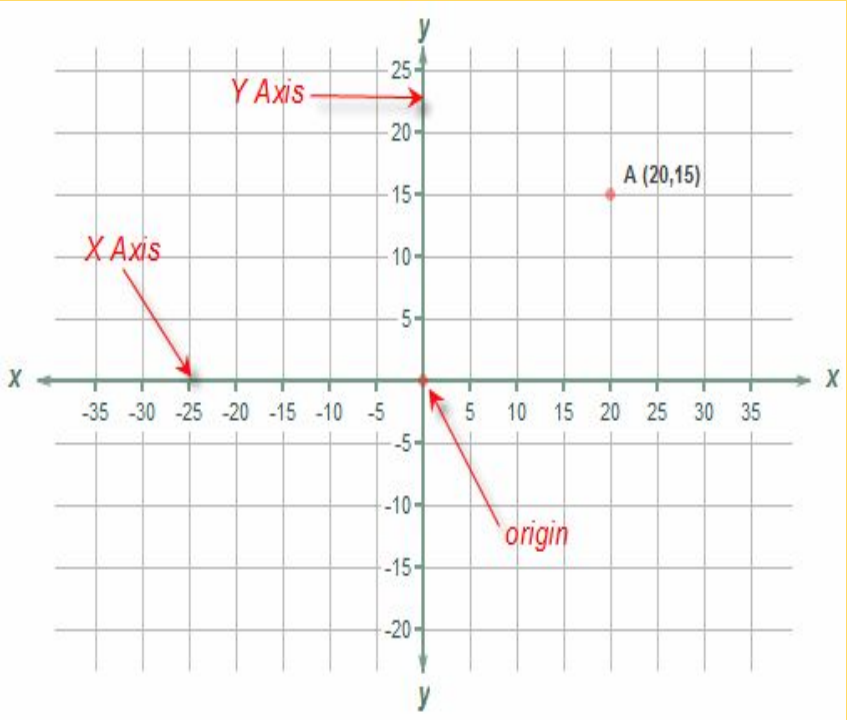

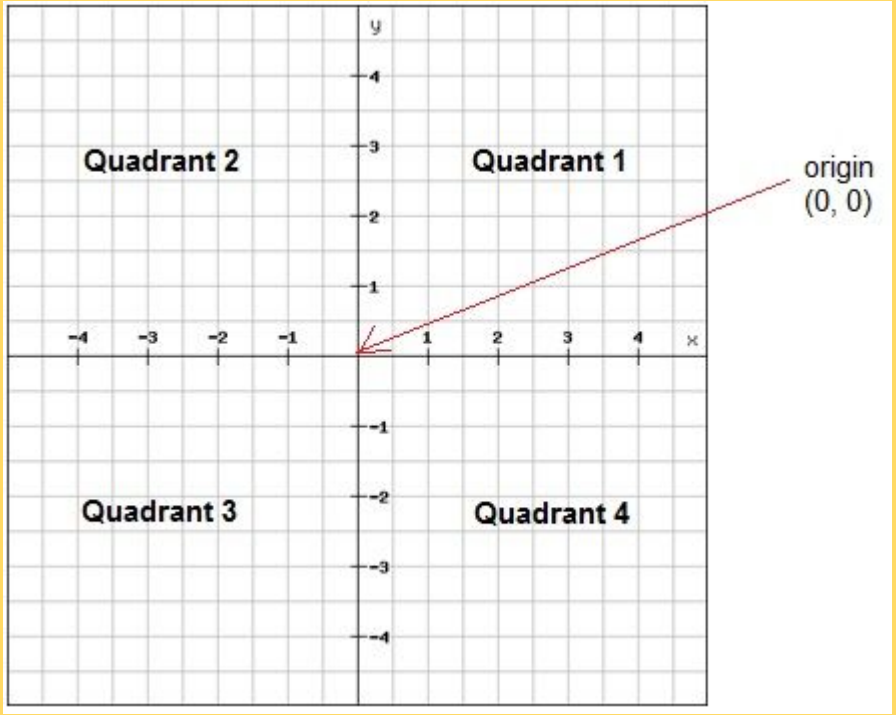

To plot the points of given co-ordinates

Suppose we have to plot the points P (4,3) and Q (-2,2)

Steps for plotting the points

(i) Draw X-axis and Y-axis on the plane. Show the origin.

(ii) To find the point P (4,3), draw a line parallel to the Y-axis through the point on X axis which represents the number 4. Through the point on Y-axis which represents the number 3 draw a line parallel to the X-axis .

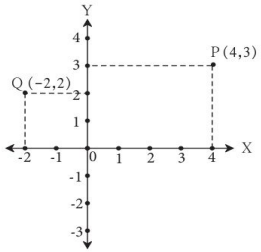

Fig. 7.6

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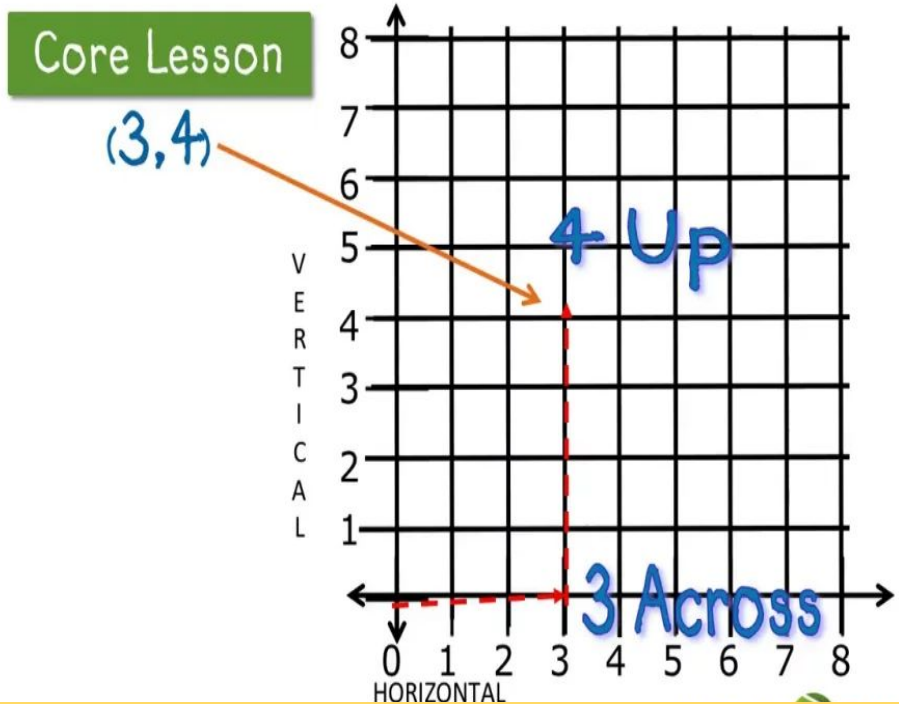
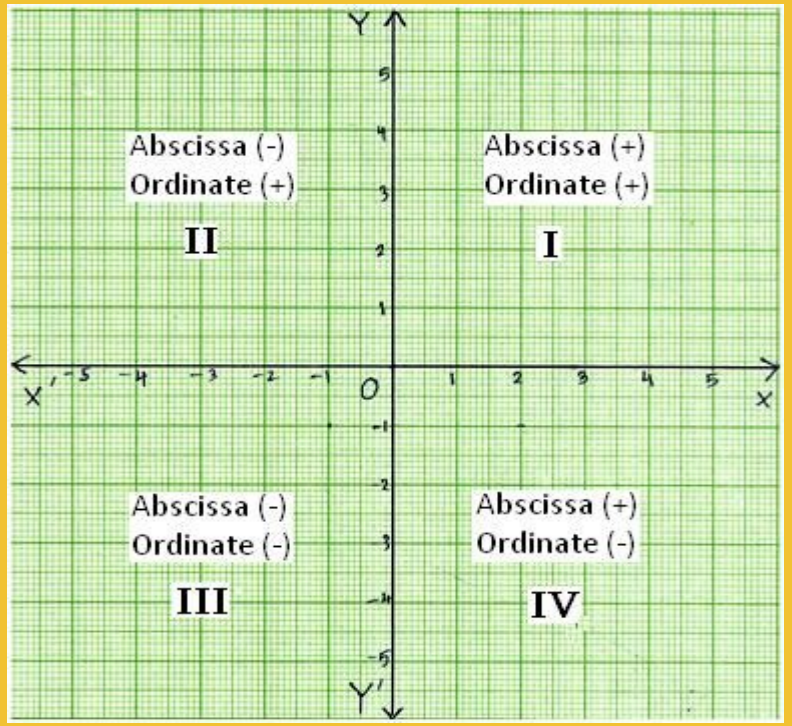
(iii) The point of intersection of these two lines parallel to the Y and X-axis respectively, is the point P (4,3). In which quadrant does this point lie ?

(iv) In the same way, plot the point Q (−2, 2) . Is this point in the second quadrant ? Using the same method, plot the points R(−3, −4), S(3, −1)



Sign Convention

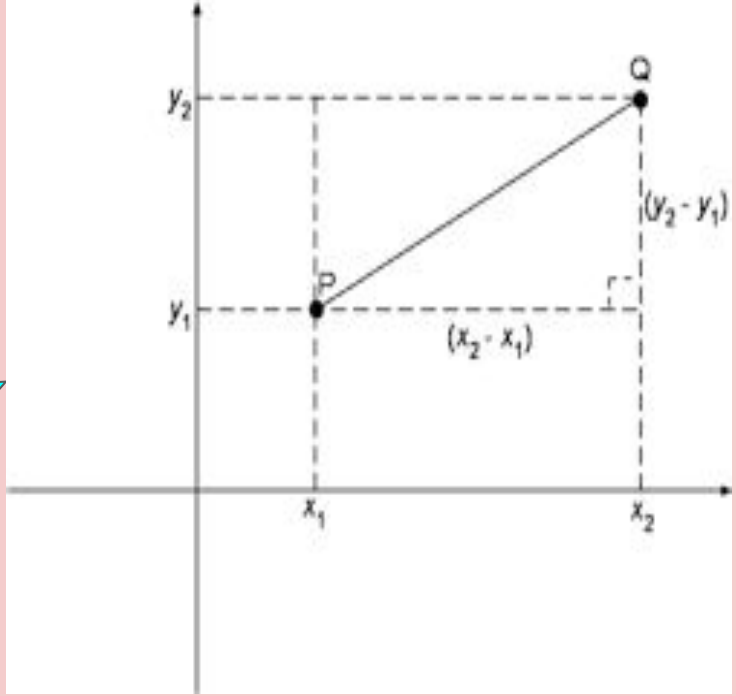
https://www.math-only-math.com/signs-of-coordinates.html (Signs of the coordinates)



Distance between two points

The **distance between two points** is the length of the line segment connecting them. Note that the **distance between two points** is always positive.

दो बिंदुओं के बीच की दूरी उन्हें जोड़ने वाले लाइन खंड की लंबाई है। ध्यान दें कि दो बिंदुओं के बीच की दूरी हमेशा सकारात्मक होती है।



Distance between two points

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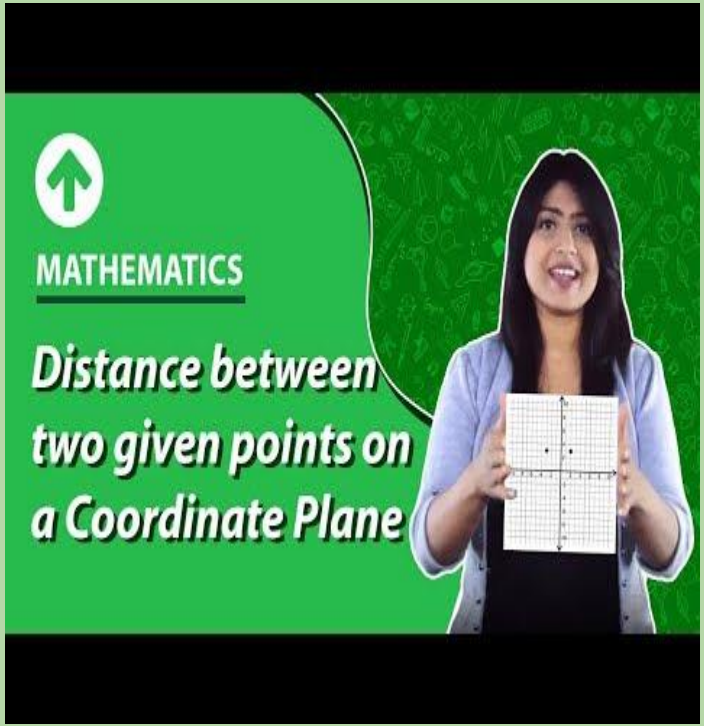
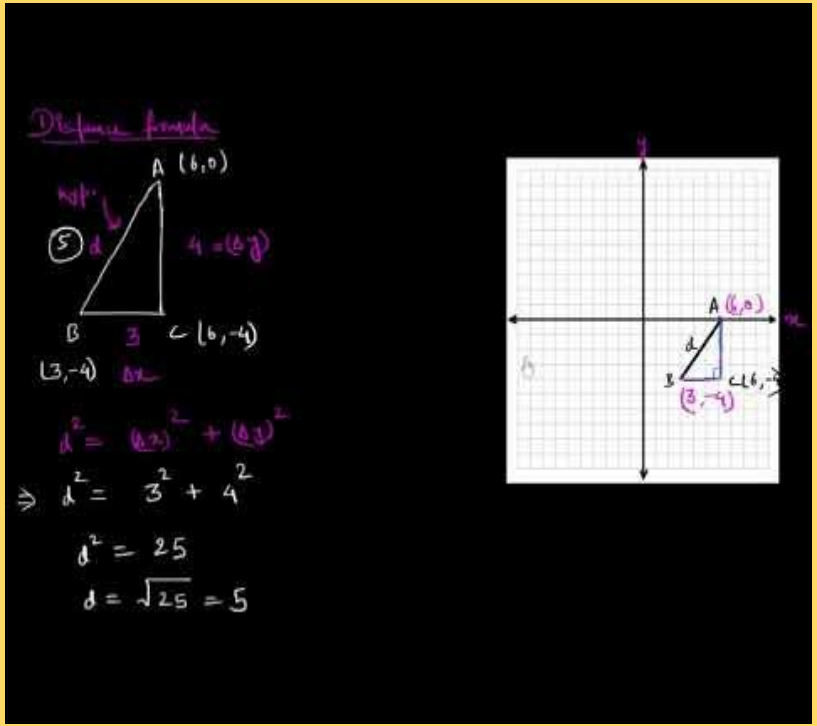


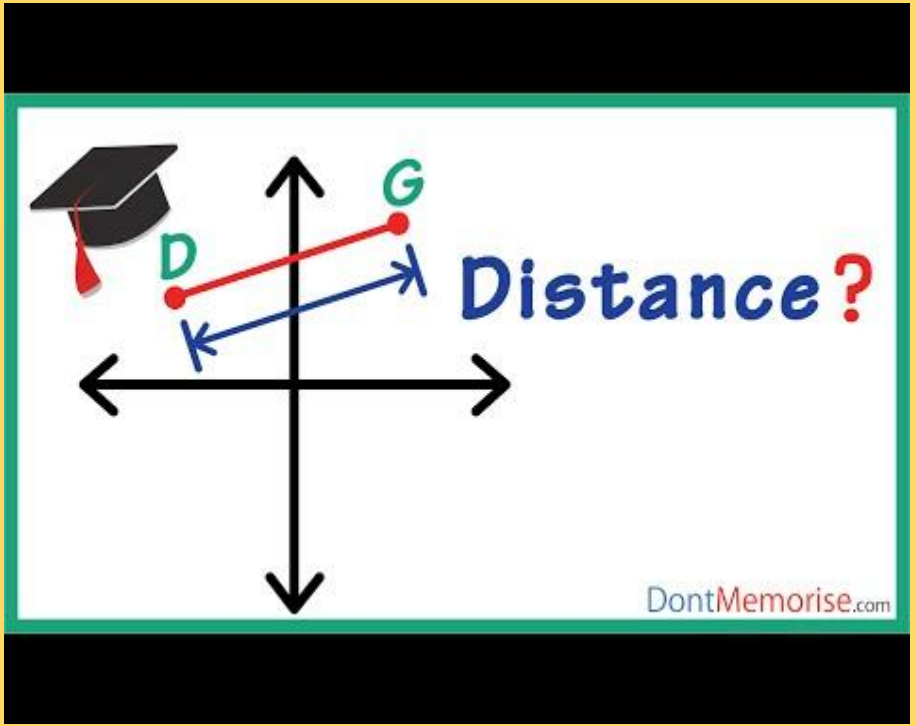
The Distance Formula

The distance between the points (x_1, y_1) and (x_2, y_2) is:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Distance formula





Section formula

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Section Formula

, the coordinates of the point **P**(x, y) which divides the line segment joining the points **A**(x_1, y_1) and **B**(x_2, y_2), internally, in the ratio **m1: m2** are

$$\left(\frac{m_1 x_2 + m_2 x_1}{m_2 + m_1}, \frac{m_1 y_2 + m_2 y_1}{m_2 + m_1} \right)$$

This is known as the **section formula**.

Section formula

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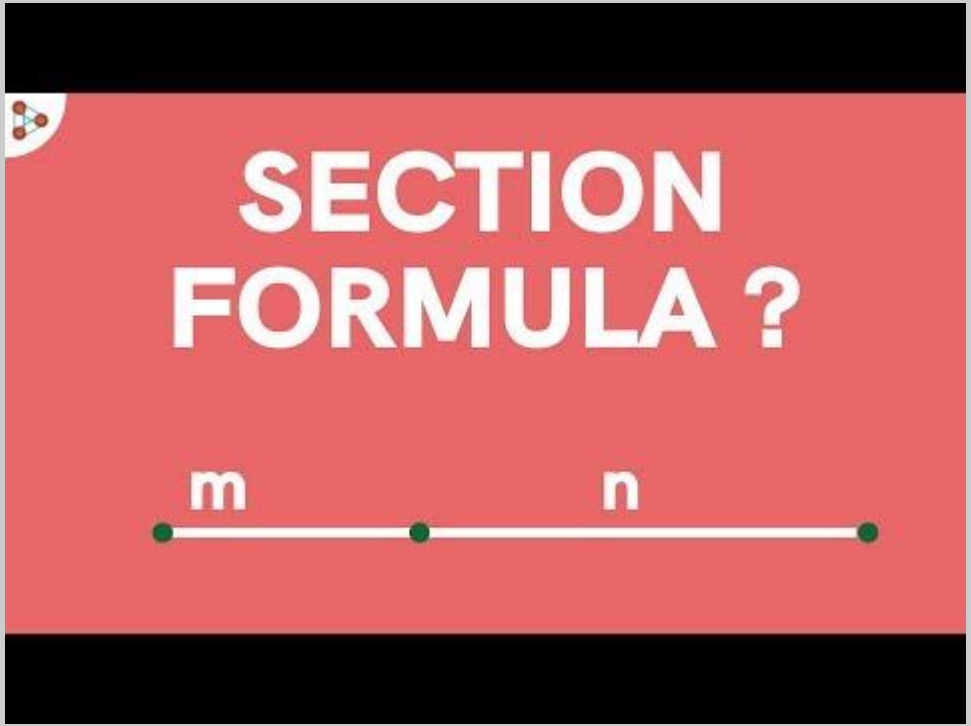

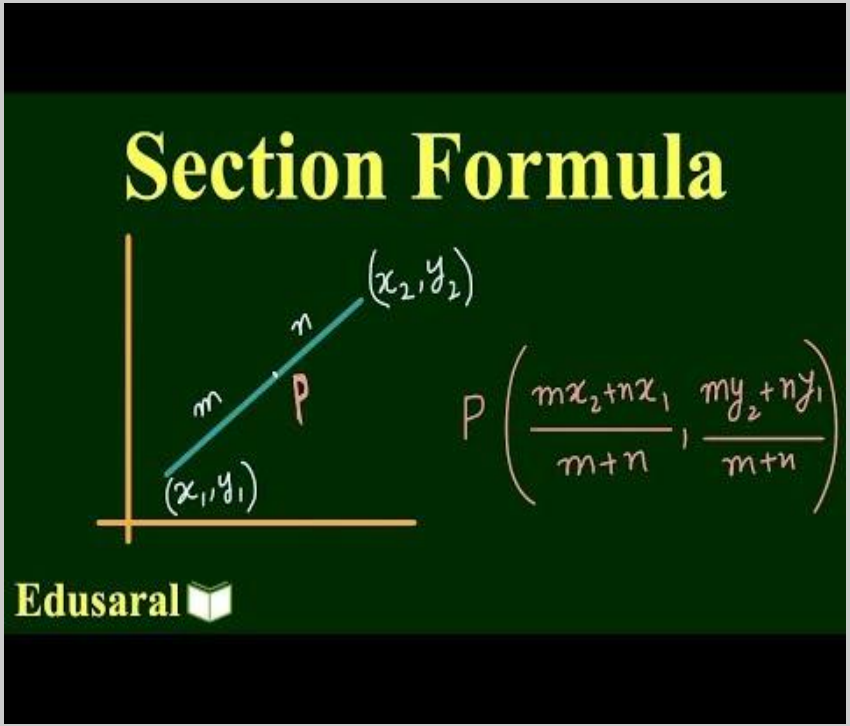

Midpoint formula

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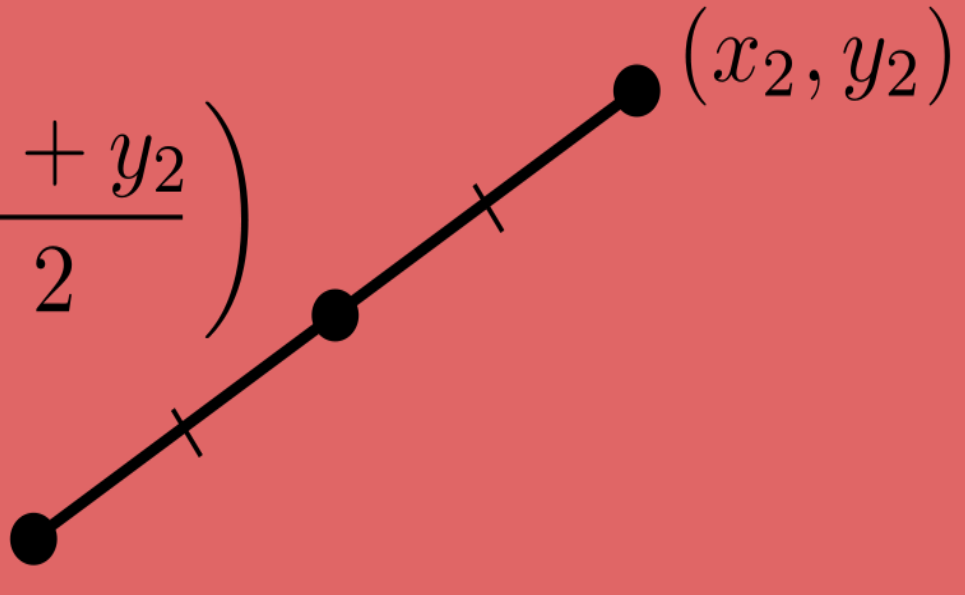
$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$



Mid point formula

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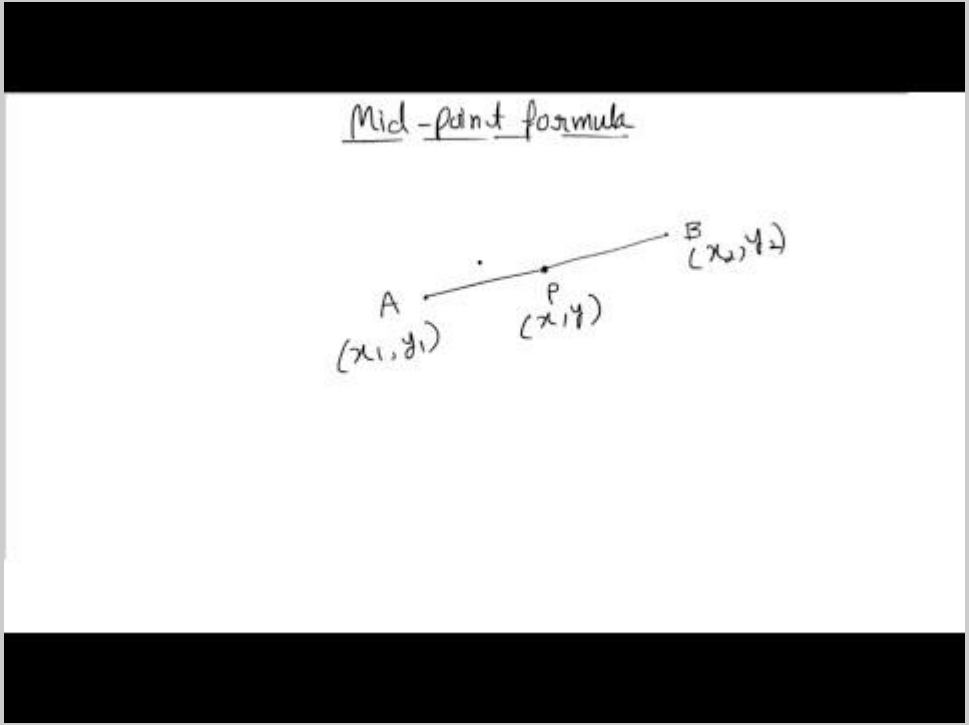

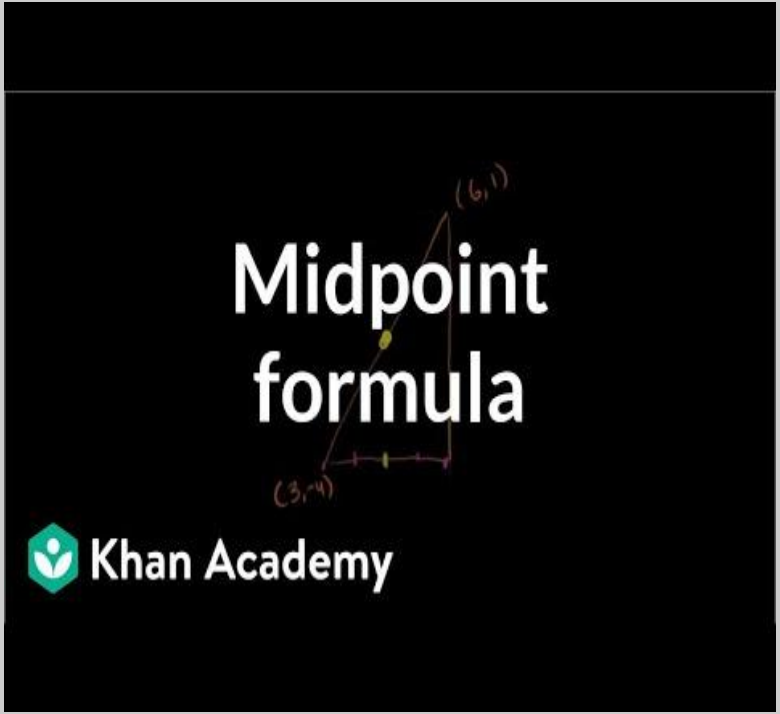


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Thank you