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# What is Distance Formula in Maths: How to Find the Distance between Two Points (For CBSE, ICSE, IAS, NET, NRA 2022)

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## Title: What is Distance Formula in Maths

- Distance between two points is the length of the interval joining the two points.
- If the two points lie on the same horizontal or same vertical line, the distance can be found by subtracting the coordinates that are not the same.
- In analytic geometry, distance formula used to find the distance measure between two lines, the sum of the lengths of all the sides of a polygon, perimeter of polygons on a coordinate plane, the area of polygons and many more.
- As an example, we can find the lengths of sides of a triangle using the distance formula and determine whether the triangle is scalene, isosceles or equilateral.

## How to Find the Distance between Two Points

- The distance between two points of the  $xy$  – plane can be found using the distance formula.
- An ordered pair  $(x, y)$  represents co-ordinate of the point, where  $x$ -coordinate (or abscissa) is the distance of the point from the centre and  $y$ -coordinate (or ordinate) is the distance of the point from the centre.

## Formula to Find Distance between Two Points in 2d Plane

Consider two points  $A(x_1, y_1)$  and  $B(x_2, y_2)$  on the given coordinate axis. The distance between these points is given as:

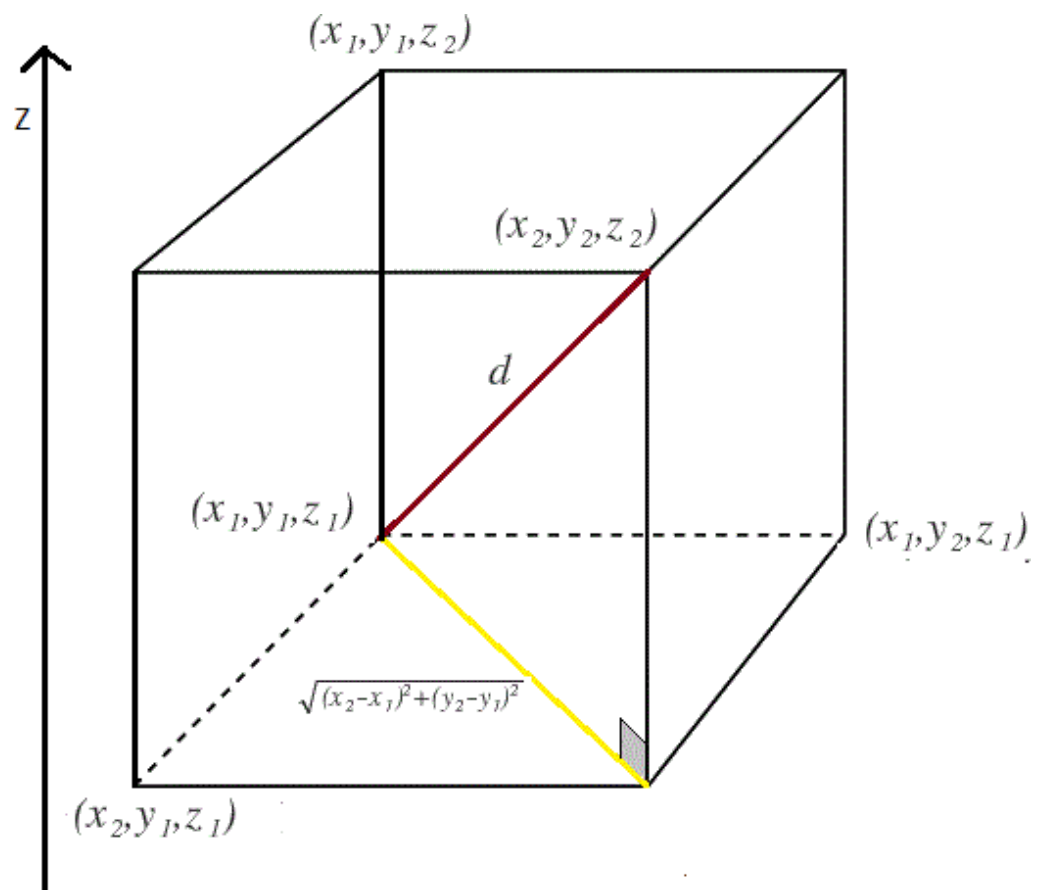
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

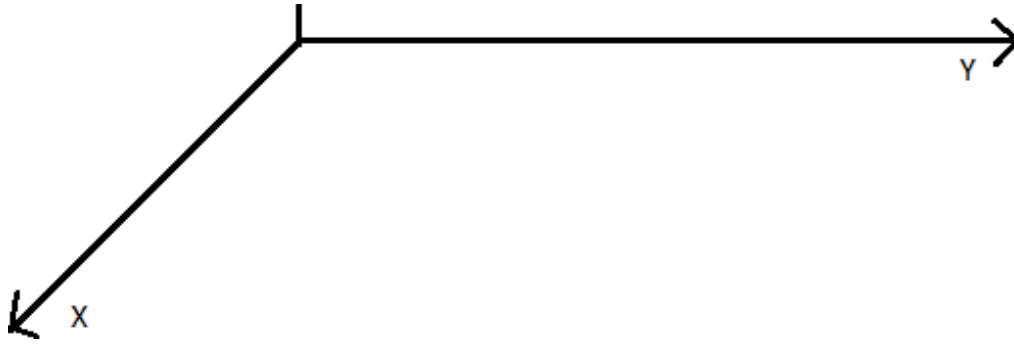
## Formula to Find Distance between Two Points in 3d Plane

Below formula used to find the distance between two points, Let

$P(x_1, y_1, z_1)$  and  $Q(x_2, y_2, z_2)$  are the two points in three dimensions plane.







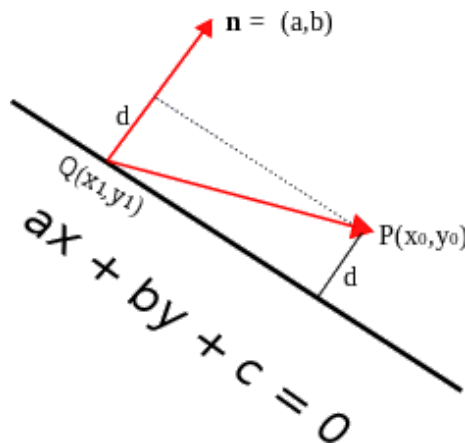
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$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

- This formula gives the distance between two points.
- Distance of any point Q (x, y, z) in space from origin O (o,o, o) is given by,

$$OQ = \sqrt{x^2 + y^2 + z^2}$$

## Distance Formula from Point to Line



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- The distance from  $(x_0, y_0)$  to this line is measured along a vertical line segment of length  $|y_0 - (-cb)| = |by_0 + c| |b|$  in accordance with the formula.
- Similarly, for vertical lines ( $b = 0$ ) the distance between the same point and the line is  $|ax_0 + c| |a|$ , as measured along a horizontal line segment.