

Grade 9 Math Formulas

Coordinate Geometry Formulas

Based on Maharashtra Board Syllabus (NEP 2025-26)

Note:

This document contains key concepts and formulas related to Coordinate Geometry for Grade 9.

The Coordinate Plane

- The Cartesian plane is formed by two perpendicular number lines, the x-axis (horizontal) and the y-axis (vertical), intersecting at the origin (0, 0).
- The axes divide the plane into four quadrants:
 - Quadrant I: $x > 0, y > 0$ (+, +)
 - Quadrant II: $x < 0, y > 0$ (-, +)
 - Quadrant III: $x < 0, y < 0$ (-, -)
 - Quadrant IV: $x > 0, y < 0$ (+, -)
- The coordinates of a point are written as an ordered pair (x, y), where x is the x-coordinate (abscissa) and y is the y-coordinate (ordinate).
- Points on the x-axis have coordinates (x, 0).
- Points on the y-axis have coordinates (0, y).
- The origin has coordinates (0, 0).

Distance Formula

- The distance between two points $P(x_1, y_1)$ and $Q(x_2, y_2)$ is given by:
Distance $PQ = \text{square root of } [(x_2 - x_1)^2 + (y_2 - y_1)^2]$
Distance $PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- The distance of a point $P(x, y)$ from the origin $O(0, 0)$ is:
Distance $OP = \text{square root of } (x^2 + y^2)$
Distance $OP = \sqrt{x^2 + y^2}$

Section Formula (Internal Division)

- The coordinates of the point $P(x, y)$ that divides the line segment joining points $A(x_1, y_1)$ and $B(x_2, y_2)$ internally in the ratio $m : n$ are given by:
 $x = (m \cdot x_2 + n \cdot x_1) / (m + n)$
 $y = (m \cdot y_2 + n \cdot y_1) / (m + n)$
 $x = \frac{m x_2 + n x_1}{m + n}$
 $y = \frac{m y_2 + n y_1}{m + n}$

Midpoint Formula

- The coordinates of the midpoint of the line segment joining points $A(x_1, y_1)$ and $B(x_2, y_2)$ are given by:
Midpoint coordinates = $((x_1 + x_2) / 2, (y_1 + y_2) / 2)$
Midpoint coordinates = $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$
- This is a special case of the Section Formula where the ratio $m : n$ is $1 : 1$.

End of Formulas - Coordinate Geometry Formulas

© 2025 Math Solver