Coordinate Geometry:

A point is represented by its x, y coordinates: P (x, y)

The shortest distance between two points P (x_1, y_1) and Q (x_2, y_2):

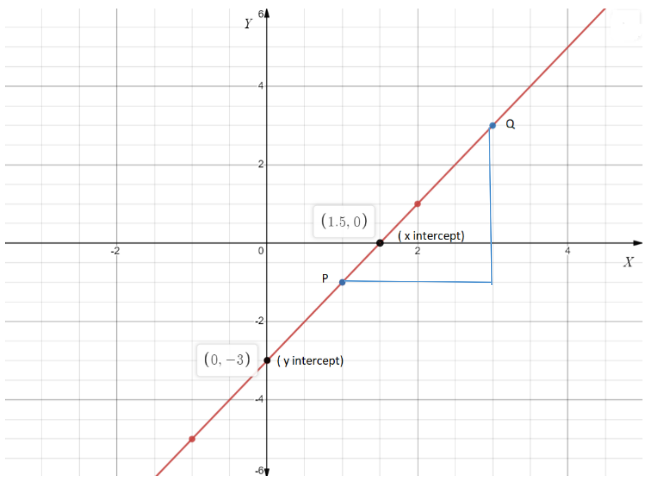
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Coordinates of the midpoint of a line segment with endpoints P (x_1, y_1) and Q (x_2, y_2):

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

Slope (gradient) of a line connecting 2 points P (x_1, y_1) and Q (x_2, y_2):

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$



Line Equation

Linear function, given slope and y intercept:

y = mx + b, in which; b stands for y intercept

Linear function, given: the slope m and one point A(x_0, y_0):

$$Y = m(x - x_0) + y_0$$

General form of linear function:

$$ax + by + c = 0$$

In which the slope is: $m = -\frac{a}{b}$, and the y intercept is: $y = -\frac{c}{b}$, (x = 0)

Parallel lines have the same slope. If two lines are Perpendicular (90°), their slopes will be as follow:

$m_1.m_2 = -1$ or $m_1 = -1/m_2$