

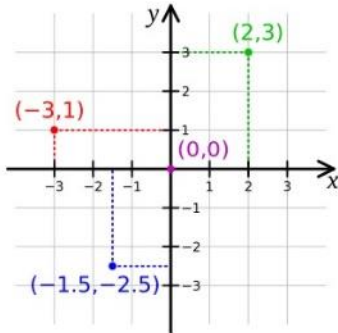
Topic 10: The Line

1) The Basics:

a) Cartesian Plane/Coordinates:

Notes:

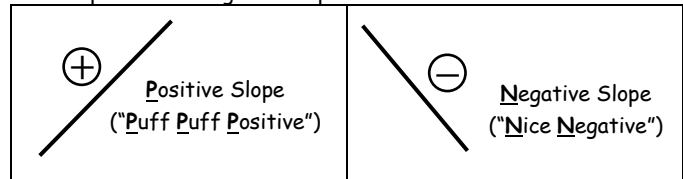
- Coordinates must be listed in brackets with a comma between the two numbers
- We always list the X value first and the Y value second...see examples in diagram above.
- The point (0,0), shown in purple, is also called the **Origin**.
- The X and Y axes divides the plane up into 4 **quadrants**
 - Quadrant 1 is top right of the plane and they are numbered in an anti-clockwise direction



c) Slope:

Notes:

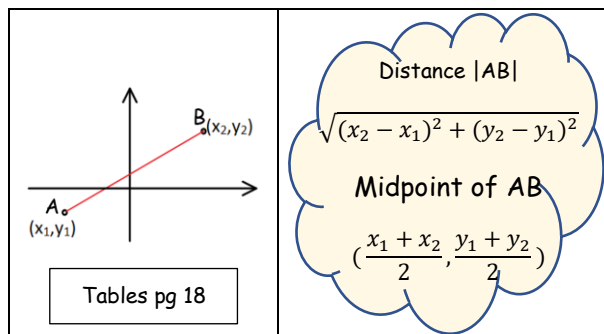
- Slope is a measure of the steepness of a line.
- Slopes can be negative or positive:



- There are three different ways we can find it:

Formula when we know 2 points:	When given diagram:	When given the equation of the line in the form $ax + by + c = 0$
<p>Slope AB</p> $\frac{y_2 - y_1}{x_2 - x_1}$	<p>Slope = $\frac{\text{RISE}}{\text{RUN}}$</p>	<p>$\frac{-x \text{ number}}{y \text{ number}}$</p>
Tables pg 18	Not in Tables	Not in Tables

b) Distance/Midpoint Formula:



d) Equation of a line:

Notes:

- A unique licence plate that identifies a particular line.
- To use the formula, we have to know:
 - A **point on the line**
 - The **slope** of the line (See section above)
- Once we know the two things above we use the formula:

$$y - y_1 = m(x - x_1)$$

Tables pg 18

- The equation of a line can also be given in the form:

$$y = mx + c$$

Tables pg 18

where 'm' = the slope and 'c' = the y-intercept (where the line crosses the y-axis)

Example: A line with equation $y = 3x - 5$ has a slope of 3 and crosses the y-axis at the point (0, -5).

e) Intersecting Lines:

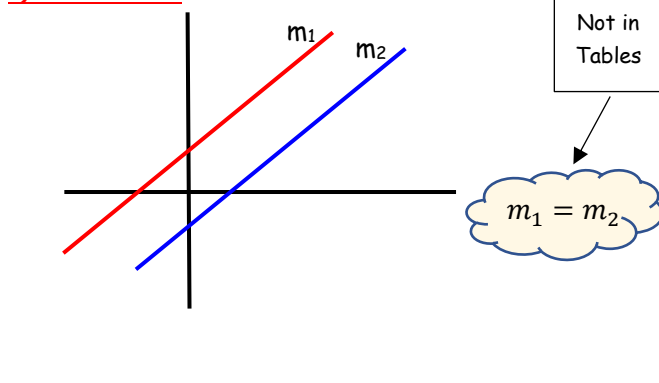
We can find where two lines meet by solving the equations simultaneously. See Algebra - Section 5

f) Graphing/Sketching Lines:

Easiest method: Find where the line crosses the x-axis ($y = 0$) and the y-axis ($x = 0$)

2) Parallel/Perpendicular Lines:

a) Parallel Lines:



b) Perpendicular Lines:

