FINDING EQUATIONS OF LINES – GIVEN TWO POINTS

METHOD 5 **(Given two points on a line (x_1, y_1) and (x_2, y_2), without graphing)**

Calculate slope using $m = \frac{y_2 - y_1}{x_2 - x_1}$.

Calculate y-intercept using the slope and one of the points given.
Substitute all values into $y = mx + b$ and solve to get b.
Rewrite the equation using values for **m** and **b** only.

} Same as method 4

Ex 8: Find the equation of the line passing through points (-3, -5) and (-1, 3)
$x_1\ y_1$ $x_2\ y_2$

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

$= \frac{3 - (-5)}{-1 - (-3)}$

$= \frac{8}{2}$

$m = 4$

$y = mx + b$

$y = 4x + b$ - sub in slope that was just calculated

$3 = 4(-1) + b$ - sub in the coordinates of one point

$3 = -4 + b$ - simplify

$3 + 4 = b$ - isolate b

$7 = b$

$y = 4x + 7$

Ex 9: Find the equation of the line passing through points (1, 4) and (2, 2)
$x_1\ y_1$ $x_2\ y_2$

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

$m = \frac{2 - 4}{2 - 1}$

$= \frac{-2}{1}$

$m = -2$

$y = mx + b$

$y = -2x + b$

$2 = -2(2) + b$

$2 = -4 + b$

$2 + 4 = b$

$6 = b$

$y = -2x + 6$