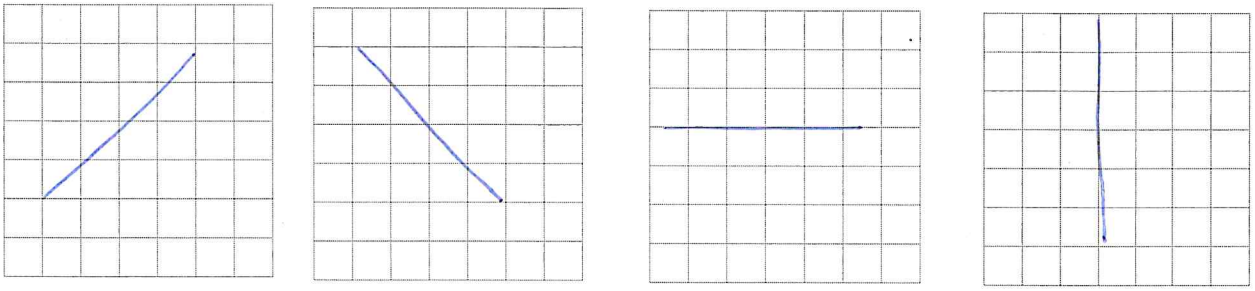
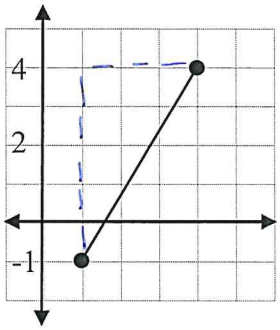
DETERMINING SLOPE USING TWO POINTS

Recall:
Draw a line that fits each description

Positive Slope | Negative Slope | Zero Slope | Undefined Slope



Example: What is the slope of the graph shown?



Slope $= \frac{\text{rise}}{\text{run}}$

$= \frac{5}{3}$

Calculating Slope Using Coordinates

Let the first point ($\overset{x_1}{1}$, $\overset{y_1}{-1}$) be represented by (x_1 , y_1)

Set the second point ($\overset{x_2}{4}$, $\overset{y_2}{4}$) be represented by (x_2 , y_2)

Remember: $Slope = \frac{rise}{run} = \frac{\text{(vertical change)}}{\text{(horizontal change)}}$ ← $y_2 - y_1$ ← $x_2 - x_1$

Rise = $y_2 - y_1$

and

Run = $x_2 - x_1$

So... therefore ***Slope*** $= \frac{y_2 - y_1}{x_2 - x_1}$

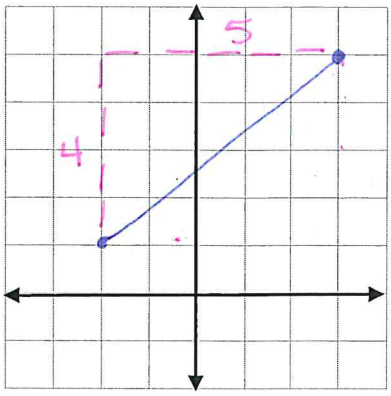
$= \frac{4 - (-1)}{4 - 1}$

$= \frac{5}{3}$

Example: Calculate the slope of a line that passes through the coordinates (3, 5) and (-2, 1)

$x_1\ y_1 \quad x_2\ y_2$

Step 1: Assign (x_1, y_1) to one point and (x_2, y_2) to the other point
Step 2: Substitute values into the slope equation
Step 3: Solve



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{1-5}{-2-3}$$
$$= \frac{-4}{-5}$$
$$= \frac{4}{5}$$

Ex: Find the slope for each line

a) A line passing through (-3,5) and (5, -2)

$x_1\ y_1 \quad x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{-2-5}{5-(-3)}$$
$$= \frac{-7}{8}$$

c) A line passing through (-10, -4) and (8, 6)

$x_1\ y_1 \quad x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{6-(-4)}{8-(-10)}$$
$$= \frac{10}{18}$$
$$= \frac{5}{9}$$

b) A line with the following table of values

x	y
1 x_1	3 y_2
2	5
3	7
4 x_2	9 y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{9-3}{4-1}$$
$$= \frac{6}{3}$$
$$= 2$$

d) A line with the following table of values

x	y
-2 x_1	1 y_1
-1	-4
0	-9
1 x_2	-14 y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{-14-1}{1-(-2)}$$
$$= \frac{-15}{3}$$
$$= -5$$