## MFM2P – Equations of Lines – Day 7: Determining Slope from Two Points

You can determine the slope of a line given **any two points** that lie on that line.

**Given two points**:

1. Label the points 1 and 2.

2. Label each x-coordinate and y-coordinate **properly**.
   - the x-coordinate of Point 1 is $x_1$
   - the y-coordinate of Point 1 is $y_1$
   - the x-coordinate of Point 2 is $x_2$
   - the y-coordinate of Point 2 is $y_2$

3. Plug the values into the equation:

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

4. Simplify the numerator (this is your rise)

5. Simplify the denominator (this is your run)

6. Reduce your fraction to lowest terms.

### Example

Find the slope of the line through the points (3, 4) and (5, 2)

① ②

$x_1$ $y_1$ $x_2$ $y_2$

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

$$= \frac{2-4}{5-3}$$

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

$$= -1$$

∴ the slope is $-1$

Determine the slope of the line through the given points.

**A (0, 3) B (2, 0)**

$m = \frac{0-3}{2-0}$

$= \frac{-3}{2}$

**C (-2, 0) D (0, 5)**

$m = \frac{5-0}{0--2}$ → 0+2

$= \frac{5}{2}$

if you subtract a negative... ADD

**E (2, 3) F (5, 0)**

$m = \frac{0-3}{5-2}$

$= \frac{-3}{3}$

$= -1$

**G (2, 1) H (3, 6)**

$m = \frac{6-1}{3-2}$

$= \frac{5}{1}$

$= 5$

**I (-3, -3) J (-3, 7)**

$m = \frac{7--3}{-3--3}$ → 7+3, → -3+3

$= \frac{10}{0}$

= undefined

**K (-2, 1) L (3, 5)**

$m = \frac{5-1}{3--2}$ → 3+2

$= \frac{4}{5}$

**M (25, 30) N (35, 20)**

$m = \frac{20-30}{35-25}$

$= \frac{-10}{10}$

$= -1$

**O (-13, -23) P (31, 17)**

$m = \frac{17--23}{31--13}$ → 17+23, → 31+13

$= \frac{40}{44}$

$= \frac{10}{11}$ lowest terms

**Q (-200, -100) R (30, -6)**

$m = \frac{-6--100}{30--200}$ → -6+100, → 30+200

$= \frac{94}{230}$

$= \frac{47}{115}$ lowest terms

**S (-12, -15) T (-20, -4)**

$m = \frac{-4--15}{-20--12}$ → -4+15, → -20+12

$= \frac{11}{-8}$

$= \frac{-11}{8}$ put the negative sign on top (rule)