

APR 13TH / 17TH

Equation of a Straight Line

The equation of a straight line is as follows:

$$\underline{y = mx + b}$$

Where:

y = y value of the coordinate

x = x value " " "

m = SLOPE ($\frac{\text{RISE}}{\text{RUN}}$) \rightarrow (HOW STEEP THE LINE IS)

b = Y-INTERCEPT (WHERE THE LINE CROSSES THE Y-AXIS)

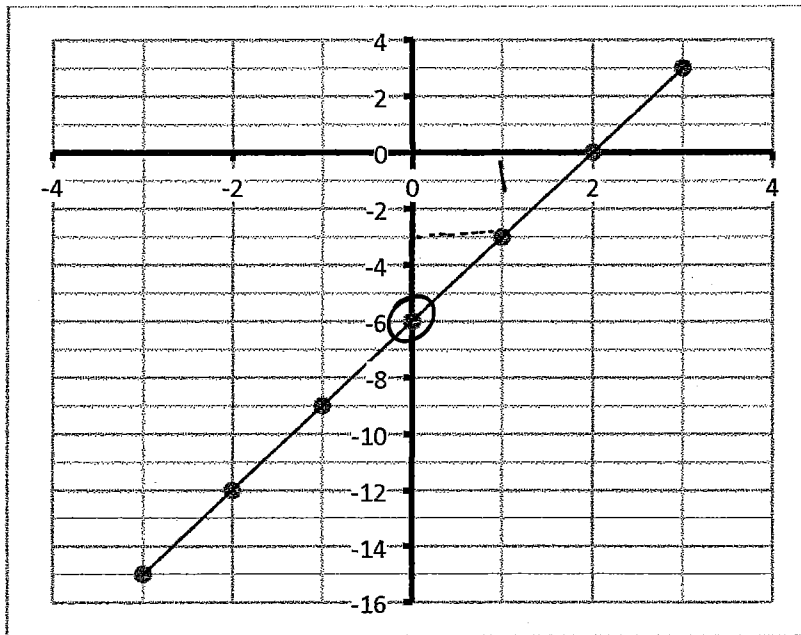
Ex. Find the equation of a straight line given the following:

Slope: $-\frac{2}{3}$

Y-intercept: 10

Equation: $y = -\frac{2}{3}x + 10$

Ex. Given the following graph, determine the equation of the straight line:



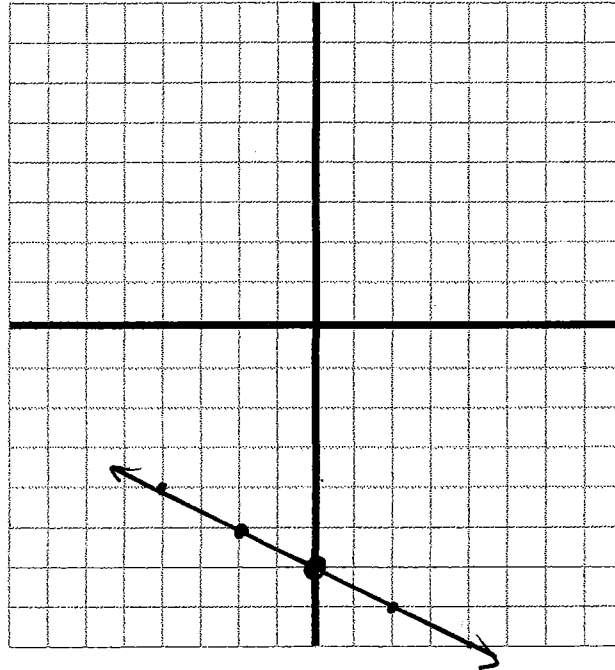
$$\frac{\text{RISE}}{\text{RUN}} = \frac{3}{1} = 3$$

Equation: $y = 3x - 6$

Ex. Given the following equation, create a linear graph:

Equation: $y = -\frac{1}{2}x - 6$

SLOPE = $\frac{\text{RISE}}{\text{RUN}} = -\frac{1}{2}$



Practice on own (Silent)

Positive and Negative Linear Relations

Linear Relations can be:

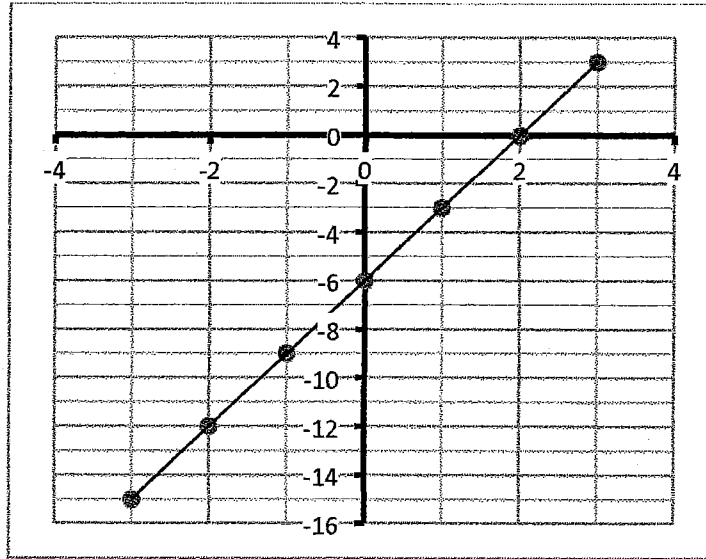
- POSITIVE
- NEGATIVE

To determine if the graph is positive or negative you must look at the SLOPE

- If the slope is negative than you have NEGATIVE RELATION
- If the slope is positive than you have a POSITIVE RELATION

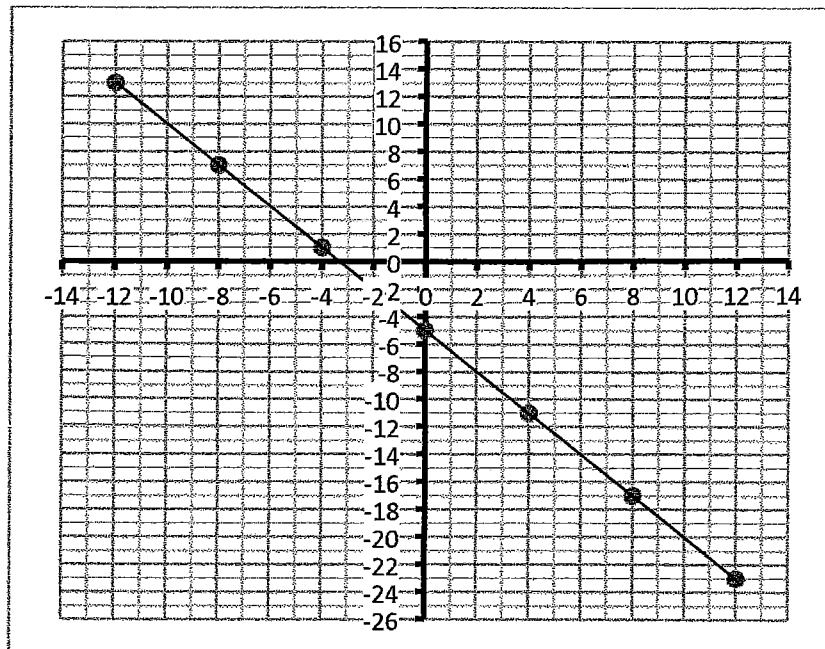
Ex. Determine if the following lines on the graph below displays either a Positive or Negative Relation.

Graph 1: $y = 3x - 6$



This graph is a POSITIVE relation.

Graph 2: $y = -\frac{3}{2}x - 5$



This graph is a NEGATIVE relation.

Ex. Look at the following equation, determine if the equation will result in a positive or negative relation.

Equation: $y = -\frac{4}{7}x - 8$

Relationship: NEGATIVE

Independent work (Silent)

Independent and Dependent Variables

Variable: X AND Y VALUES

Independent Variable → VARIABLE THAT YOU CAN CONTROL

Dependent Variable → VARIABLE WHOSE VALUE DEPENDS ON THE INDEPENDENT VARIABLE. YOU CANNOT DIRECTLY CONTROL THIS VARIABLE.

Ex. Dropping a brick off a building. You can choose how high to drop the brick from the building (2nd floor, 8 floor, top of roof) You cannot control how long the brick takes to hit the ground.

What is the Independent Variable: THE BUILDING'S HEIGHT

What is the Dependent Variable: HOW LONG THE BRICK FALLS

We say that Y is the DEPENDENT VARIABLE and plot it on the Y-axis (Vertical)

The INDEPENDENT VARIABLE X is plotted on the X-axis (Horizontal)

A change in the value of the X VARIABLE, will change of value of Y

The value of the variable Y DEPENDS on the value of the variable X

When the two variables are related, we have a RELATION

When the graph of the relation is a straight line we call it a LINEAR RELATION