

LINEAR EQUATIONS

Linear equations are equations that have two variables and when graphed are a straight line. Linear equation can be graphed based on **their slope and y-intercept**. The standard equation for a line is $y = mx + b$, where m is the slope and b is the y-intercept. Linear equations often have both of the variables on the same side of the equal sign and therefore must be solve for y before it can be graphed.

- The **slope** of the line is the m in the equation $y = mx + b$.
- It is also the rise/run of a line and can be found with the *formula* $(y_2 - y_1)/(x_2 - x_1)$.

- The **intercept** is the b in the equation $y = mx + b$.
- A **line** is a straight line that passes through the **intercept** and has a **slope**.

How

Line

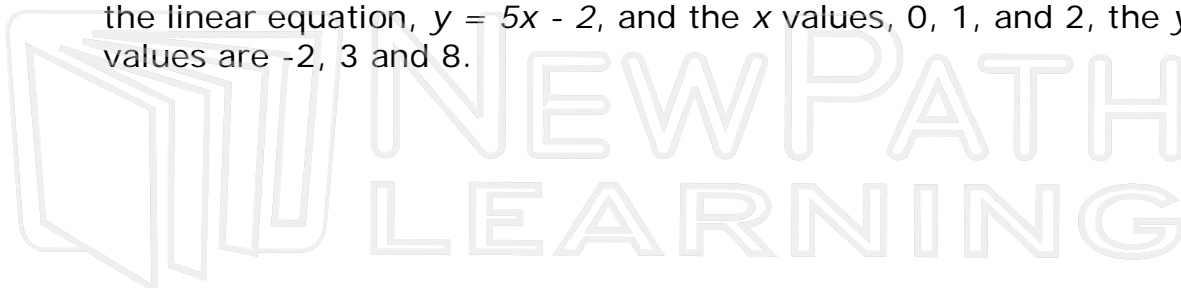
a line
values are points on the line.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

- If a linear equation is given, along with certain x values, the y values can be found by substituting in the x values and solving for y . With the linear equation, $y = 5x - 2$, and the x values, 0, 1, and 2, the y values are -2, 3 and 8.



The **slope** of a line is the m in the equation $y = mx + b$. It can be found with the formula $m = (y_2 - y_1)/(x_2 - x_1)$, which represents the change in y over the change in x .

- Slope is also referred to as the rise over the run. For the linear equation, $y = -3x - 2$, the slope is -3 .
- If a linear equation is not in the form $y = mx + b$, it must be put into that form before finding the slope.
- The **y-intercept** of a line is the b in the equation $y = mx + b$. The y-intercept is the y coordinate of the point where the line crosses the y -axis. To find the y-intercept a linear equation must be in the form of $y = mx + b$.

• For the equation $y = 6x - 3$, what is the y-intercept? $y = 6x - 3$

Example

6x - 3

If the

four

slope

• I

by substituting in the equation, $y - b = m(x - a)$, this is called the **point-slope form**.

- For example, what is the equation of a line that has a slope of -8 and goes through the point, $(2, -2)$?

Example:

$$y - b = m(x - a)$$

$$y - (-2) = -8(x - 2)$$

$y + 2 = -8x + 16 \rightarrow$ **this is the equation of a line in point-slope form**

- If the slope of a line is given as being parallel to another line, remember that parallel lines have equal slopes.

