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* $(y_2 - y_1)/(x_2 - x_1)$.
- T… …he y-i… …the y-a…
- A… …on can b… …**rm**.

How…

Lin… …es of a lin… …nd y values are points on the line.

- 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 $y = mx + b$.
- F = 6?

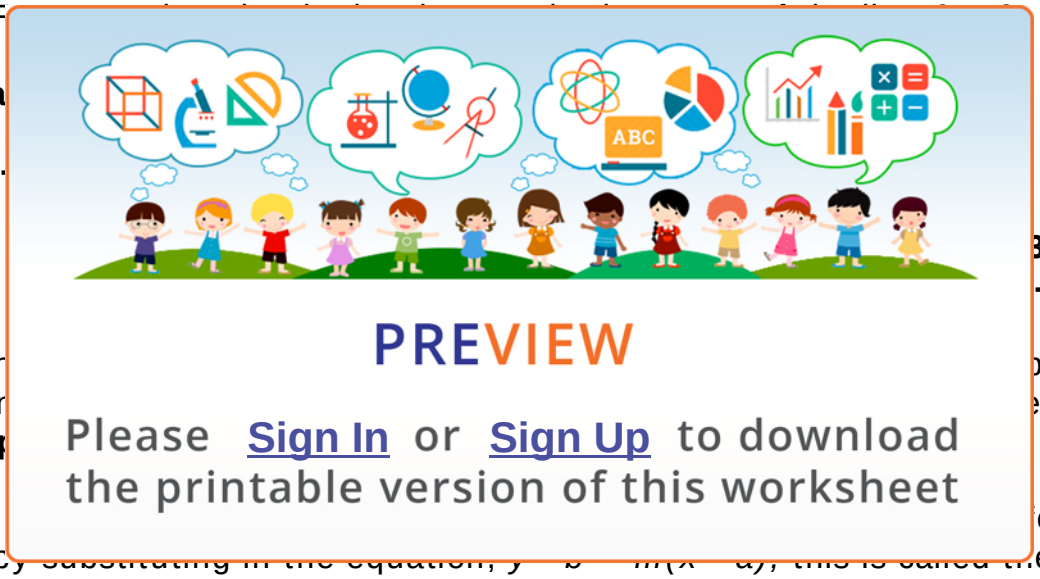
Exa

6x

3;
-3

If th be
four
slop

- I ound
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 → 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.

Try This!

1. What are the **y values** for the linear equation, 9x + y = 27 when x is 0,1 and 2?

2. What is the **slope** of a line that goes through the points (5, 4) and (-1, -2)?

3. W ?

4. W ?

5. W rcept o

6. What is the **equation of a line** that has a slope of 4 and goes through the point (-2, -8) in point-slope form?

7. What is the **equation of a line** that is parallel to the line y = -4x + 6 and goes through the point (5, -1) in point-slope form?