

Warm-Up



1. Put your phones away.
2. Turn in your 4B/4C HW Calendar
3. Look over your test from yesterday and ask any questions. You guys did great!!

What am I learning today?

Learning Objective 5.1

How to create parallel and perpendicular linear equations.

Lines are normally written in **SLOPE-INTERCEPT** form

$$Y = \underline{M}X + \underline{B}$$

Y-Intercept (0, y) is represented by the **B** variable

Slope is represented by the **M** variable

A point ON the line is represented by the **X** and **Y** variables

1. Write a linear equation with a slope of 2 and a y-intercept of (0, -4)

$$m = 2$$

$$b = -4$$

$$y = 2x - 4$$

2. Write a linear equation with a slope of 2 and goes through the point (-1, 2)

$$\begin{aligned}x &= -1 \\y &= 2 \\m &= 2\end{aligned}$$

$$\begin{aligned}2 &= 2(-1) + b \\2 &= -2 + b \\+2 & \quad +2 \\4 &= b\end{aligned}$$

$$y = 2x + 4$$

3. Write a linear equation with a slope of (1/3) and goes through the point (2, -9)

$$\begin{aligned}x &= 2 \\y &= -9 \\m &= \frac{1}{3}\end{aligned}$$

$$\begin{aligned}-9 &= \frac{1}{3}(2) + b \\-9 &= \frac{2}{3} + b \\-\frac{2}{3} & \quad -\frac{2}{3} \\-\frac{29}{3} &= b\end{aligned}$$

$$y = \frac{1}{3}x - \frac{29}{3}$$

4. Write a linear equation with an undefined slope that goes through the point (-4, 7)

HØY

VUX

• Horizontal
↔

• zero slope
 $m = 0$

• $y = \#$

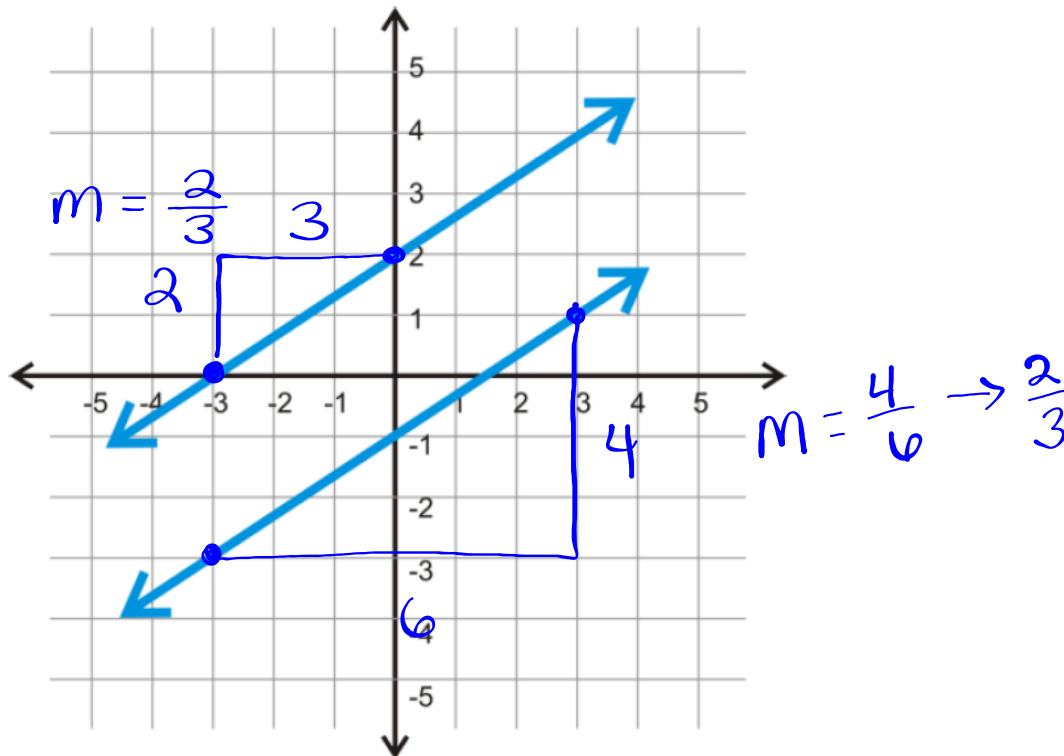
• vertical ↓

• undefined slope

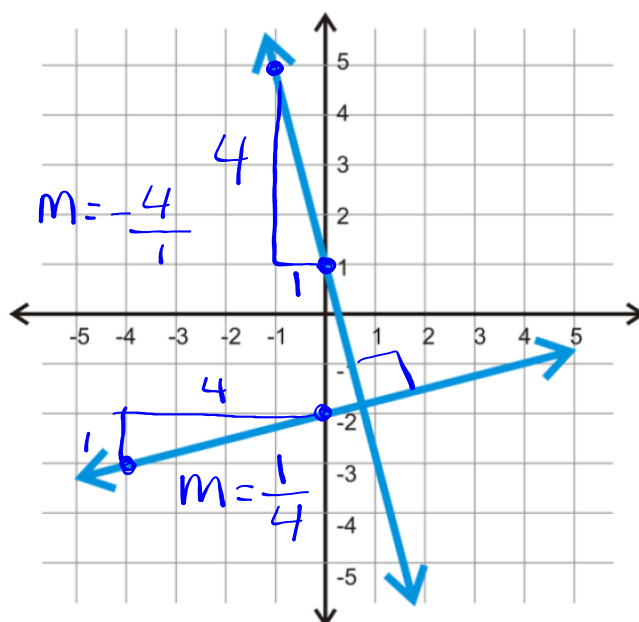
• $x = \#$

$$x = -4$$

Parallel Lines - They have the **SAME** slope!
This is why parallel lines **DO NOT TOUCH!!**



Perpendicular Lines - They have **OPPOSITE RECIPROCAL** slopes of each other! This is why perpendicular lines always create a 90° **ANGLE** at their intersection point!



1. Find the slope of a parallel line to ~~$y = 3x + 2$~~
 same $m = 3$

2. Find the slope of a perpendicular line to ~~$y = 3x + 2$~~
 opp. rec. $m = -\frac{1}{3}$

3. Find the slope of a parallel line to $x = 5$ VUX
 same $m = \text{undefined}$ \uparrow

4. Find the equation of a parallel line to ~~$y = 3x + 2$~~ and goes through the point (1, 2)

NEW
 $m = 3$
 $x = 1$
 $y = 2$

$$2 = 3(1) + b$$

$$2 = 3 + b$$

$$-3 \quad -3$$

$$-1 = b$$

$$y = 3x - 1$$

5. Find the equation of a perpendicular line to ~~$y = 3x + 2$~~ and goes through the point (1, 2)

NEW
 $m = -\frac{1}{3}$
 $x = 1$
 $y = 2$

$$2 = -\frac{1}{3}(1) + b$$

$$2 = -\frac{1}{3} + b$$

$$+\frac{1}{3} \quad +\frac{1}{3}$$

$$\frac{7}{3} = b$$

$$y = -\frac{1}{3}x + \frac{7}{3}$$

6. Find the equation of the line parallel to $y = -3$ and passes through the point $(8, -3)$

$$y = -3$$

HOY
↑
HOY

7. Find the equation of a line perpendicular to $x = 4$ and passes through the point $(3, 6)$

VUX
↓
HOY

$$y = 6$$

Classwork:



Complete the classwork about linear equations. **SHOW ALL WORK!**

HW: Finish your classwork and EOC HW #10