TOPIC: SLOPE AND SLOPE-INTERCEPT FORM

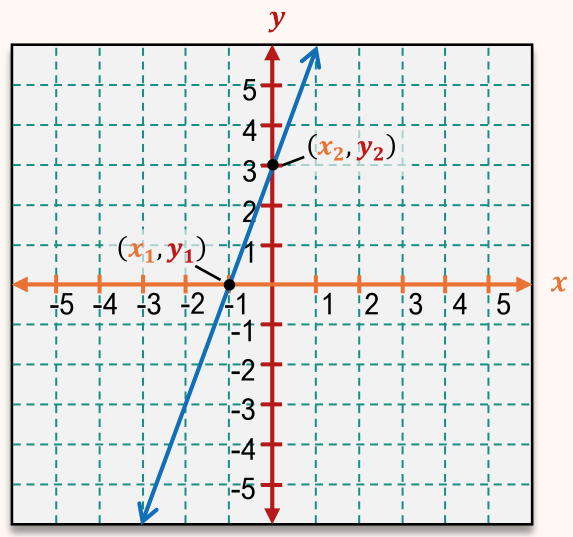
Finding the Slope of a Line

◆ Given a line, you will need to find the **slope** (m), which tells you how _____ a line is.

► The slope can be found by _____ how much y **changes (_____)** by how much x **changes (_____)**.

EXAMPLE Identify two points on the graph and calculate the slope.

New **Finding Slope from a Graph**



$$m = \frac{rise}{run} = \text{_____} = \frac{\Delta y}{\Delta x}$$

Δ = "change"

$m =$ ____ $=$

$(x_1, y_1) = (-1, 0)$

$(x_2, y_2) = (0, 3)$

$m =$ _____ $=$

◆ It does not matter which point you choose as (x_1, y_1) & (x_2, y_2) as long as you subtract in the correct order.

EXAMPLE Find the slope of each line given two points that exist on the line.

$(1, 2), (4, 5)$

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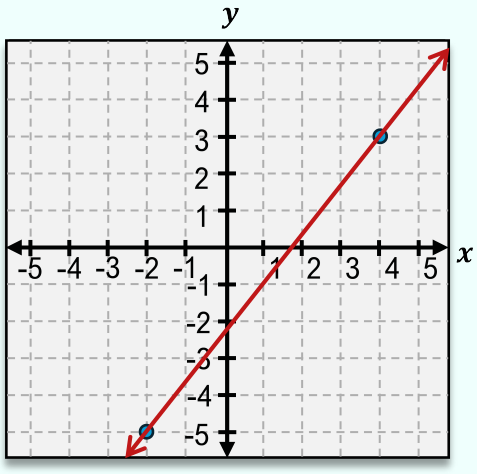
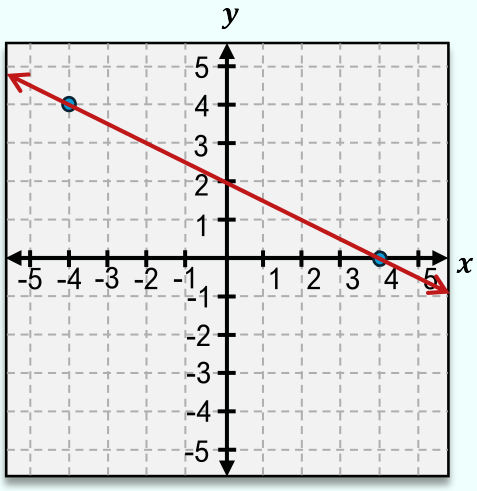
EXAMPLE Find the slope of the following line based on the two indicated points.



EXAMPLE Find the slope of the following line based on the two indicated points.



TOPIC: SLOPE AND SLOPE-INTERCEPT FORM

EXAMPLE Find the slope of the following line. *Hint: Find the x- and y-intercepts first.*

$2x + 3y = 12$

PRACTICE Find the slope of the following lines.

(*A*)

$\frac{1}{2}x - \frac{2}{3}y = 4$

(*B*)

$0.5x + 0.2y = 3$

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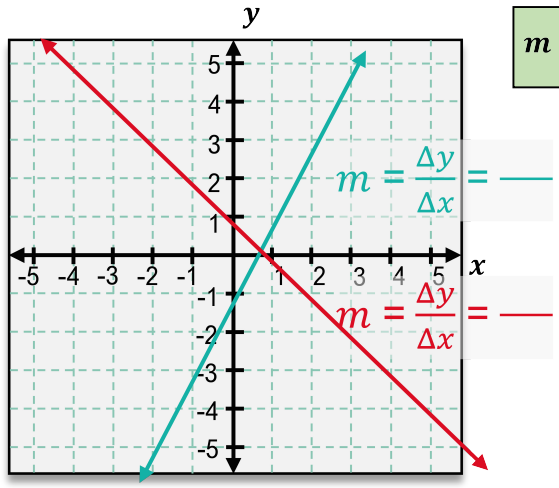
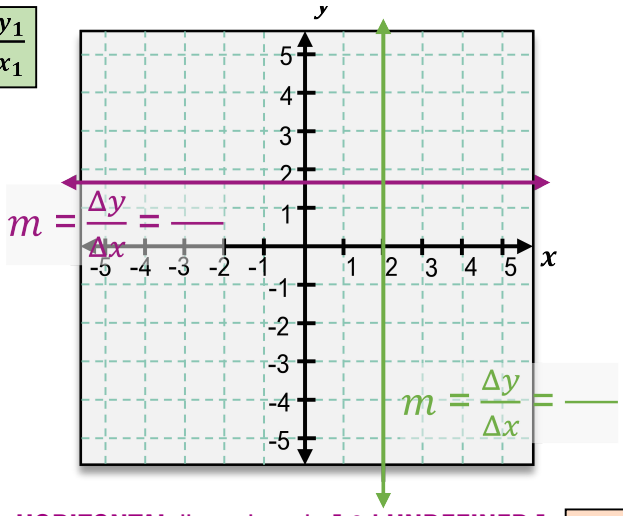
Types of Slope

◆ Slope can be **positive**, **negative**, **zero**, or **undefined**.



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

(*Slope*)



If line goes **UP** from left to right, slope is **[+ | –]**

If line goes **DOWN** from left to right, slope is **[+ | –]**

HORIZONTAL line: slope is **[0 | UNDEFINED]** $y = \#$

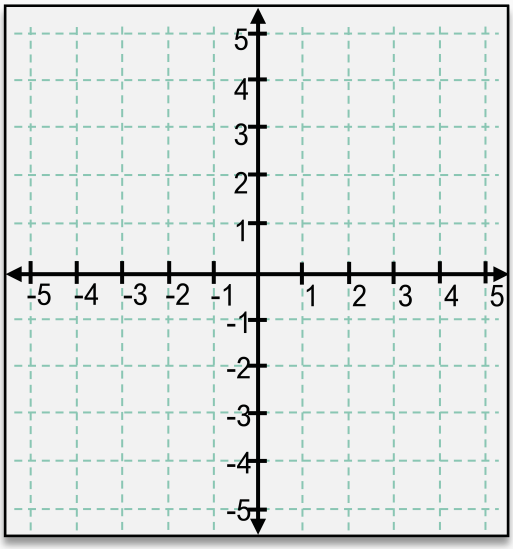
VERTICAL line: slope is **[0 | UNDEFINED]** $x = \#$

TOPIC: SLOPE AND SLOPE-INTERCEPT FORM

PRACTICE Graph a line with a slope of 0 that passes through the point $(3, -2)$.

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

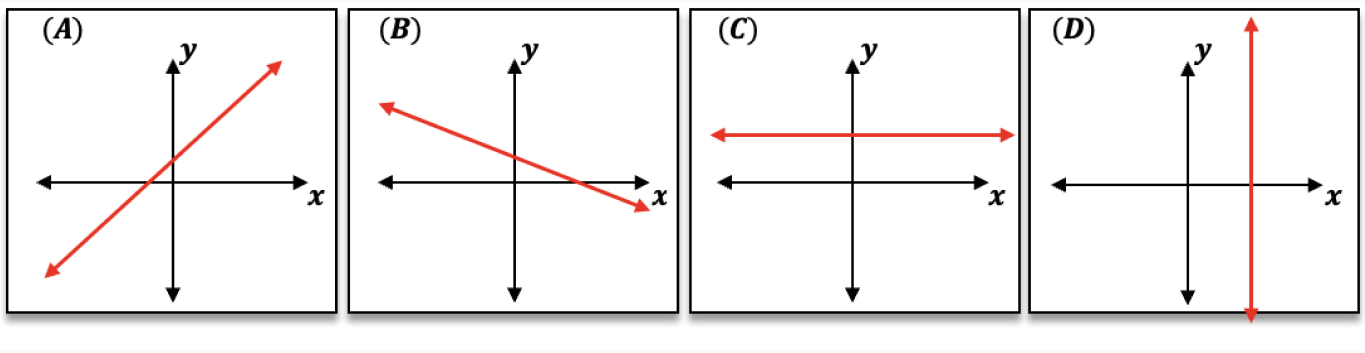
(*Slope*)



PRACTICE Which of the following graphs below represents the equation $x = 3$?

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

(*Slope*)



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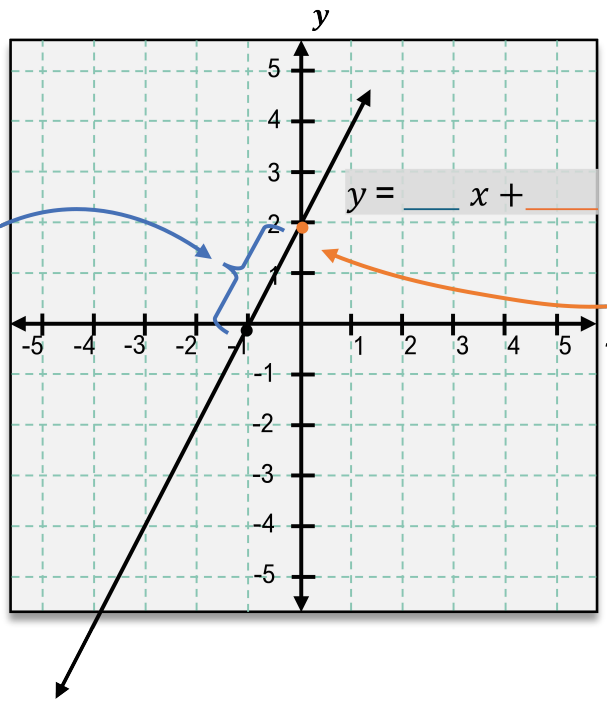
Slope Intercept Form

◆ We can rewrite the equation of a line using its _____ & _____.

$y = \_\_x + \_\_$

(Slope - Intercept Form)



Slope = 2

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

y – Intercept =

y – value where line crosses y – axis

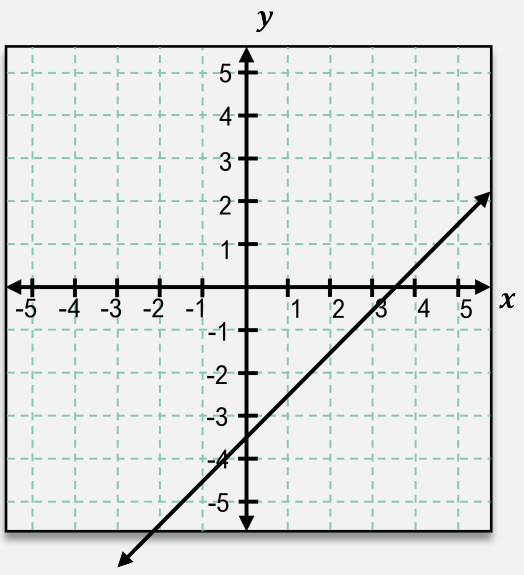
$(x = 0)$

EXAMPLE: In the graph below, identify the y – intercept & slope.

Write the equation in slope-intercept form.

$b =$ _____

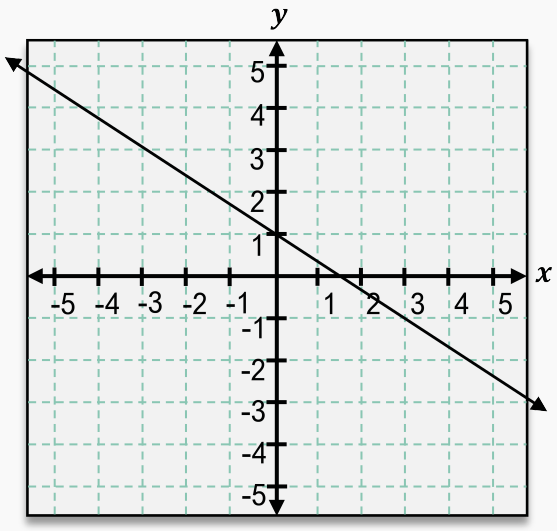
$m =$ _____



TOPIC: SLOPE AND SLOPE-INTERCEPT FORM

PRACTICE In the graph shown, identify the y – intercept & slope. Write the equation of this line in Slope-Intercept form.

$$y = mx + b$$



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PRACTICE Determine the equation of a line given its slope and y-intercept. Write in slope-intercept form.

(A)

Slope $= 4$

y-intercept $= -2$

(B)

Slope $= -3$

y-intercept $= \frac{5}{2}$

EXAMPLE Identify the slope of the line given by each equation.

(A)

$y = -3$

(B)

$x = 5$

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Graphing Lines from Equations in Slope Intercept Form

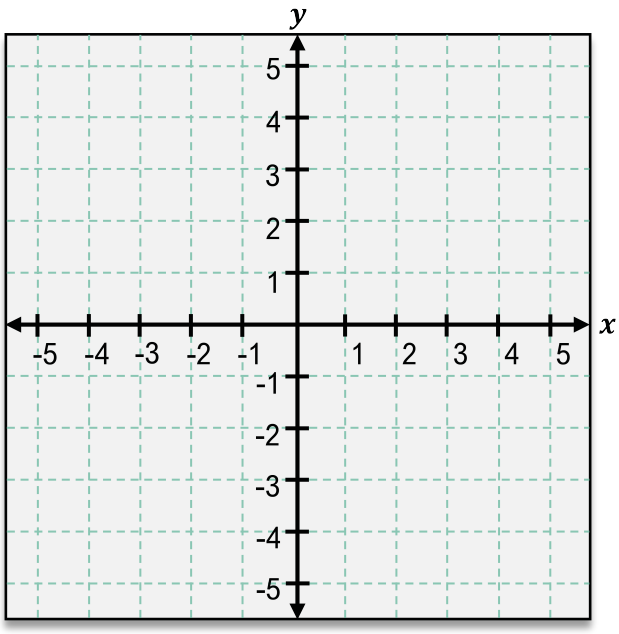
◆ A line equation in slope-intercept form tells you everything you need to graph it!

$$y = mx + b$$

EXAMPLE: Identify the y – intercept & slope of $y = \frac{2}{3}x + 1$, then graph the equation.

$b =$ _____

$m =$ _____



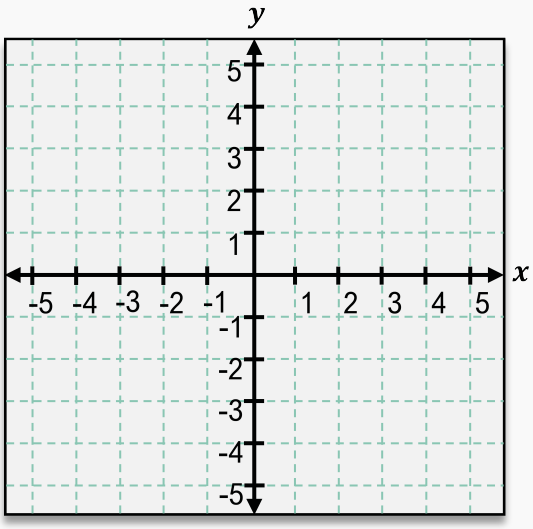
Graphing Lines in Slope-Intercept Form

1) Plot y – intercept $(0, b)$

2) Plot ONE more point using slope $\left(\frac{rise}{run}\right)$:

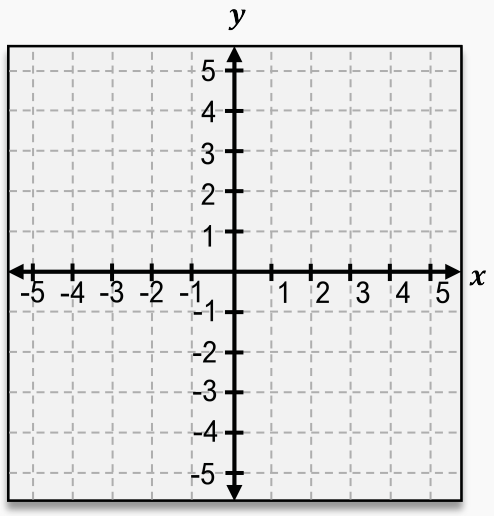
3) Connect points with a line

PRACTICE Identify the y – intercept & slope of $y = -2x - 3$. Then graph the equation.



TOPIC: SLOPE AND SLOPE-INTERCEPT FORM

PRACTICE Graph the line represented by the equation $y = -\frac{4}{5}x + 2$



EXAMPLE A ride-share company models a driver's weekly earnings with the equation $y = 18.50x - 72.50$ where y is the net weekly profit in dollars and x is the number of rides given.

($\boldsymbol{A}$) Find the driver's profit for a week when no rides are given.

($\boldsymbol{B}$) Find the profit for a week when 15 rides are given.

($\boldsymbol{C}$) Interpret the slope and the y-intercept of the equation.