5-6-19

Aim: SWBAT find the slope of a line given two points on the line.

HW: Packet Pages 21 - 22
Review due Thursday
Test Friday

Do Now: Correct hw, then Quiz

Homework - Slopes and Intercepts of Lines

'en an equation is solved for y it is in y = mx + b form

he slope is represented by: m The y-intercept is represented by: b

he coordinates of the y-intercept are: (0, b)

lopes and Intercepts of Lines: Complete the Chart
'he general equation for a line is ax + by = c where a, b and c are any real numbers.

Equation	Equation Solved for y	x-Intercept ($y=0$)	y-Intercept ($x=0$)	Slope
1) $x + y = 5$	$x+y=5$, $-x$, $y=-x+5$	$x+y=5$, $x+0=5$, $x=5$	$x+y=5$, $0+y=5$, $y=5$	-1
2) $x - y = 4$	$x-y=4$, $-x$, $\frac{-y}{-1}=\frac{-x+4}{-1}$, $y=x-4$	$x-y=4$, $x-0=4$, $x=4$	$x-y=4$, $0-y=4$, $\frac{-y}{-1}=\frac{4}{-1}$, $y=-4$	1
3) $2x + 5y = 10$	$2x+5y=10$, $-2x$, $\frac{5y}{5}=\frac{-2x+10}{5}$, $y=-\frac{2}{5}x+2$	$2x+5y=10$, $2x+5\cdot0=10$, $\frac{2x}{2}=\frac{10}{2}$, $x=5$	$2x+5y=10$, $2\cdot0+5y=10$, $\frac{5y}{5}=\frac{10}{5}$, $y=2$	$\frac{-2}{5}$
4) $3x - 6y = 12$	$3x-6y=12$, $-3x$, $\frac{-6y}{-6}=\frac{-3x+12}{-6}$, $y=\frac{1}{2}x-2$	$3x-6y=12$, $3x-6\cdot0=12$, $\frac{3x}{3}=\frac{12}{3}$, $x=4$	$3x-6y=12$, $3\cdot0-6y=12$, $\frac{-6y}{-6}=\frac{12}{-6}$, $y=-2$	$\frac{1}{2}$
5) $5x - 2y = 10$	$5x-2y=10$, $-5x$, $\frac{-2y}{-2}=\frac{-5x+10}{-2}$, $y=\frac{5}{2}x-5$	$5x-2y=10$, $5x-2\cdot0=10$, $\frac{5x}{5}=\frac{10}{5}$, $x=2$	$5x-2y=10$, $5\cdot0-2y=10$, $\frac{-2y}{-2}=\frac{10}{-2}$, $y=-5$	$\frac{5}{2}$
6) $6x + 3y = 12$	$6x+3y=12$, $-6x$, $\frac{3y}{3}=\frac{-6x+12}{3}$, $y=-2x+4$	$6x+3y=12$, $6x+3\cdot0=12$, $\frac{6x}{6}=\frac{12}{6}$, $x=2$	$6x+3y=12$, $6\cdot0+3y=12$, $\frac{3y}{3}=\frac{12}{3}$, $y=4$	-2

7) Find the x and y intercept algebraically for $4y + 24x = 16$. **Show work.**

x-intercept (let y=0)

$4y + 24x = 16$

$4(0) + 24x = 16$

$\frac{24x}{24} = \frac{16}{24}$

$x = \frac{2}{3}$

x-intercept = $\frac{2}{3}$

Coordinates $(\frac{2}{3}, 0)$

y-intercept (let x=0)

$4y + 24x = 16$

$4y + 24(0) = 16$

$\frac{4y}{4} = \frac{16}{4}$

$y = 4$

y-intercept = 4

Coordinates (0, 4)

8) Find the x and y intercept algebraically for $2y + 2x = 12$. **Show work.**

x-intercept (let y=0)

$2y + 2x = 12$

$2(0) + 2x = 12$

$\frac{2x}{2} = \frac{12}{2}$

$x = 6$

x-intercept = 6

Coordinates (6, 0)

y-intercept (let x=0)

$2y + 2x = 12$

$2y + 2(0) = 12$

$\frac{2y}{2} = \frac{12}{2}$

$y = 6$

y-intercept = 6

Coordinates (0, 6)

9) Find the x and y intercept algebraically for $6x-4y = 36$. **Show work.**

x-intercept (let y=0)

$6x - 4y = 36$

$6x - 4(0) = 36$

$6x = 36$

$\frac{6x}{6} = \frac{36}{6}$

$x = 6$

x-intercept = 6

Coordinates (6 , 0)

y-intercept (let x=0)

$6x - 4y = 36$

$6(0) - 4y = 36$

$-4y = 36$

$\frac{-4y}{-4} = \frac{36}{-4}$

$y = -9$

y-intercept = -9

Coordinates (0, -9)

Aim: SWBAT find the slope of a line given two points on the line.

Do Now: Given the following equations, name the slope and y-intercept.

1) $y + 5x = -9$

$y = -5x - 9$ slope = -5

y-intercept = -9

2) $4y = 12x + 6$

$y = 3x - \frac{3}{2}$ slope = 3

y-intercept = $-\frac{3}{2}$

Notes.

To find the actual slope of a line we need to find how the "x" coordinates and the "y" coordinates have changed from point to point. We do this by **finding the difference between the two y-coordinates and the difference between the two x-coordinates.**

Slope is represented by the variable "**m**".

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

Since each point has an x-coordinate and a y-coordinate, (x, y), we differentiate between the two by calling them point "1" and point "2".

When you are **finding** the **slope** you should **BE CONSISTENT!**

For Example: Find the slope of a line that contains A (3, 6) and B (2, 7).

(You need to decide which ordered pair you're going to start with first and be consistent with it.)

(Starting with B)

$m = \frac{\Delta y}{\Delta x} = \frac{7 - 6}{2 - 3}$

$m = \frac{1}{-1}$

$m = -1$

OR

(Starting with A)

$m = \frac{\Delta y}{\Delta x} = \frac{6-7}{3-2}$

$m = \frac{-1}{1}$

$m = -1$

Notice it does not matter which point you start with as long as you are CONSISTENT!

Find the slope of the line that contains each pair of points.

1) (3, -9) and (4, -12) $x_1\ y_1 \quad x_2\ y_2$

$\frac{\Delta y}{\Delta x} \rightarrow \frac{y_2 - y_1}{x_2 - x_1} \rightarrow \frac{-12 - -9}{4 - 3}$

$= \frac{-3}{1} = -3$

slope = -3

2) (1, 0) and (2 ,5) $x_1\ y_1 \quad x_2\ y_2$

$\frac{\Delta y}{\Delta x} \rightarrow \frac{y_2 - y_1}{x_2 - x_1} \rightarrow \frac{5 - 0}{2 - 1}$

$= \frac{5}{1} = 5$

slope = 5

3) $x_1\ y_1\quad x_2\ y_2$
(0, 3) and (4, 4)

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

$$m = \frac{4 - 3}{4 - 0}$$

$$m = \frac{1}{4}$$

4) $x_1\ y_1\quad x_2\ y_2$
(1, -9) and (-3, 1)

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

$$m = \frac{1 - -9}{-3 - 1}$$

$$m = \frac{10}{-4}$$

$$m = \frac{5}{-2}$$

5) $x_1\ y_1\quad x_2\ y_2$
(6, -1) and (4, -1)

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

$$m = \frac{-1 - -1}{4 - 6}$$

$$m = \frac{0}{-2}$$

$$m = 0$$

6) $x_1\ y_1\quad x_2\ y_2$
(3, 8) and (3, 1)

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

$$m = \frac{1 - 8}{3 - 3}$$

$$m = \frac{-7}{0}$$

m = undefined

Homework – Finding Slope

Find the slope of the line that contains each pair of points.

1) $x_1\ y_1$ (5, 3) $x_2\ y_2$ (-1, 1)

2) $x_1\ y_1$ (-3, 1) $x_2\ y_2$ (4, 5)

3) $x_1\ y_1$ (2, 3) $x_2\ y_2$ (-1, 3)

4) $x_1\ y_1$ (-1, -2) $x_2\ y_2$ (2, -5)

5) $x_1\ y_1$ (5, -2) $x_2\ y_2$ (4, -3)

6) $x_1\ y_1$ (7, 3) $x_2\ y_2$ (3, -9)

7) $x_1\ y_1$ (5, -4) $x_2\ y_2$ (5, -9)

8) $x_1\ y_1$ (1, 0) $x_2\ y_2$ (-2, -3)

9) Is the equation $y = x^2 - 3$ a linear equation? Answer yes or no. _____

10) Is the equation $y = x + 5$ a linear equation? Answer yes or no. _____

Identify the slope and y-intercept in each equation.

11) $y = -2x + 3$

Slope = _____ y – intercept = _____

12) $y = x - 7$

Slope = _____ y – intercept = _____

Given the slope and y-intercept write an equation in y = mx + b form.

13) m = -3 and b = 4

_____

14) $m = \frac{1}{4}$ and b = -5

_____

Rewrite the following equations in slope-intercept form.

15) $5x - 10y = 25$

16) $5x - y = 8$

Find the x and y intercepts algebraically and write the coordinates of each.

17) $5x - 10y = 25$

18) $5x - y = 8$

19) Graph the equation $y = 5x$, using slope intercept.

Slope = _____

y – intercept = _____

Details of Slope: