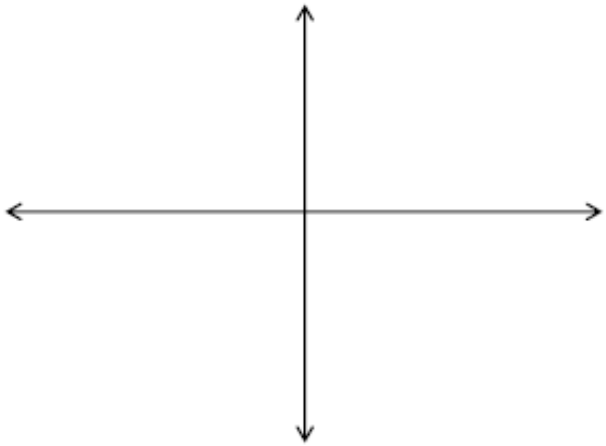
Lesson 4.2 Understanding Slope Intercept

Week 10 Thursday Course 3 Warm-up

Find the Slope
(7, 4) (3, 4)

Sketch the points (7, 4) and (3, 4)



Solve an Equation Containing Fractions

$$\frac{a}{15}+\frac{4}{15}=\frac{9}{15}$$

Write number in scientific notation
8,003,000

Simplify Expression

$$3x^2 \bullet x^2$$

Solve an Equation Containing Decimals
4x + 3.6 + x = 1.2

Solve & Check
14x – 20 = 12x + 40

Week 10 Thursday Course 3 Warm-up

Find the Slope

(7, 4) (3, 4)

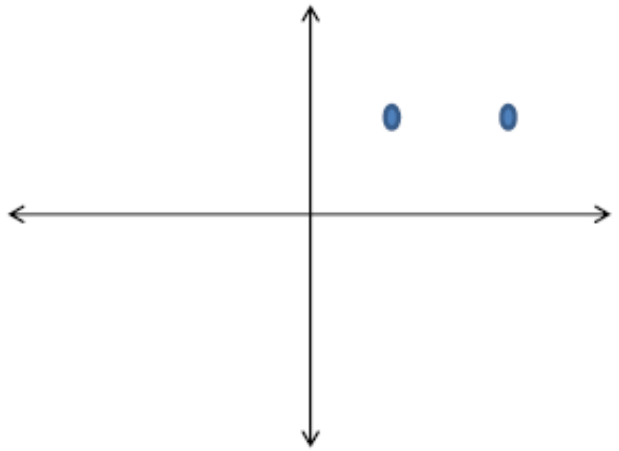
$\frac{4-4}{3-7} = \frac{0}{-4} = 0$

Given two points: (x_1, y_1) (x_2, y_2)

Slope Formula:

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

Sketch the points (7, 4) and (3, 4)



Solve an Equation Containing Fractions

$$\frac{a}{15} + \frac{4}{15} = \frac{9}{15}$$

5

Write number in scientific notation

8,003,000

8.003 x 10 ^6

Simplify Expression

$3x^2 \cdot x^2$

$3x^4$

Solve an Equation Containing Decimals

4x + 3.6 + x = 1.2

-0.48

Solve & Check

14x – 20 = 12x + 40

X=30

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Quick Write-

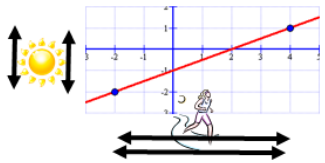
a) What is slope?

b) How can you find the slope of a line?

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Quick Write-

Slope: $m = \frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{rise}{run} = \frac{\text{vertical change}}{\text{horizontal change}}$



RISE 3 1

RUN 6 2

a) What is slope?

*Slope is the steepness of a line

*Rise over Run

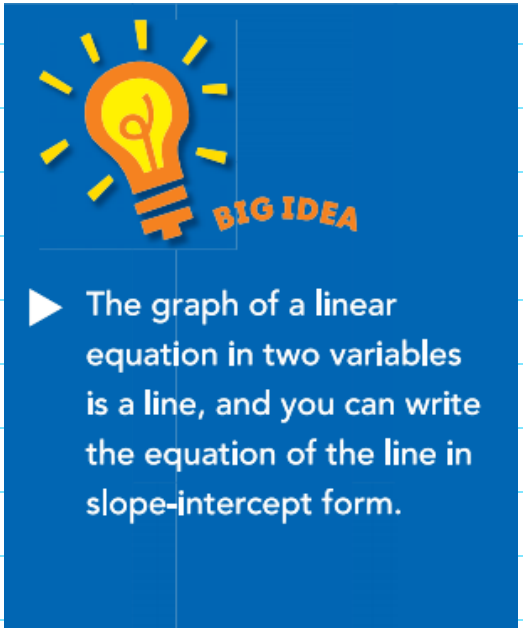
b) How can you find the slope of a line?

*Using a table

*Using Two Points- Formula $= \frac{y_2 - y_1}{x_2 - x_1}$

*From Graph- count rise over run

Lesson 4.2 Understanding Slope Intercept Form (Day 1)



Objective

TSW find the slope of lines by

*interpreting table

*graphing

*using slope formula $= \frac{y_2 - y_1}{x_2 - x_1}$.

***using slope intercept form**

y=mx+b

Common Core State Standards

8EE 5 Graph proportional relationships, interpreting the unit rate as the slope of a graph.

8 EE 6 …derive the equation y=mx for a line through the equation y=mx+b for a line intercepting the vertical axis at b

- **Mathematical Practices** *2 Reason 4 Model Mathematics 5 Use tools 8 Express regularity in reasoning*

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Vocabulary

- What is slope intercept form?

Visual example:

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Vocabulary

- What is slope intercept form?

A linear equation written in the form $y = mx + b$ is said to be written in **slope-intercept form**. The constant m represents the slope of the line, and the constant b represents the y-intercept of the line.

Visual example:

Slope-Intercept Form: $y = mx + b$

slope Y-Intercept

Slope: $\frac{1}{2}$ Y-Intercept : -1 Equation: $y = \frac{1}{2}x - 1$

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

What is slope intercept form?

A linear equation written in the form $y = mx + b$ is said to be written in **slope-intercept form**. The constant m represents the slope of the line, and the constant b represents the y-intercept of the line.

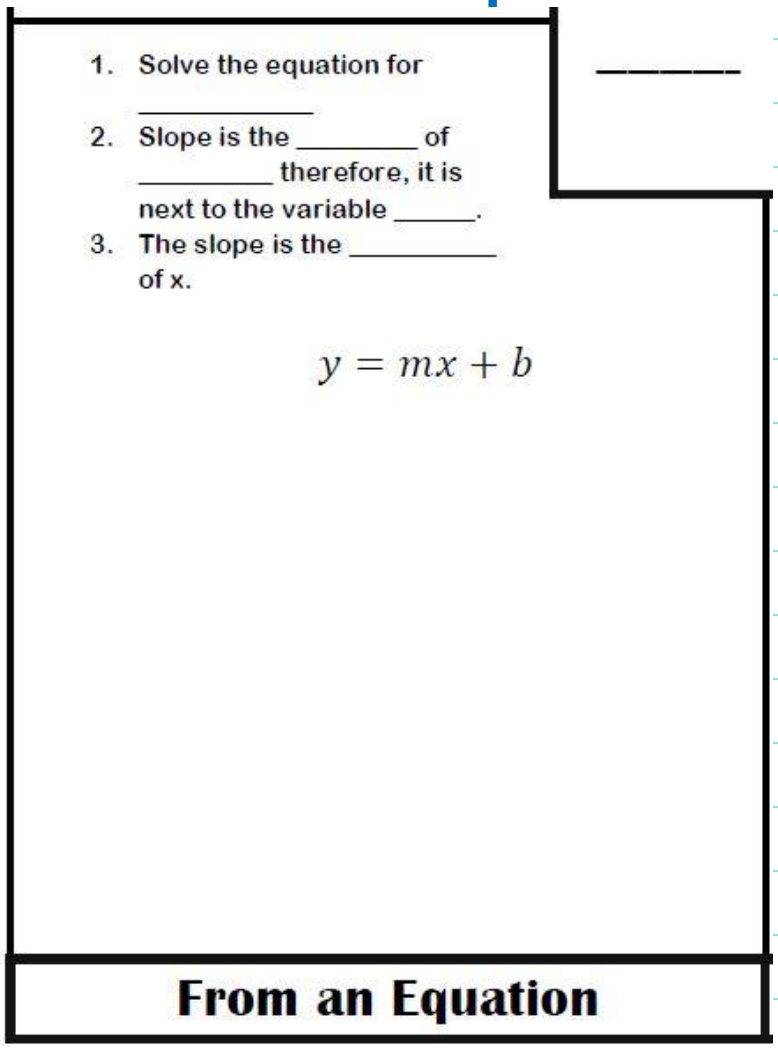
Slope-Intercept Form: $y = mx + b$

slope Y-Intercept

Slope: $\frac{1}{2}$ Y-Intercept : -1 Equation: $y = \frac{1}{2}x - 1$

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Find the slope using equations



y=1/2x + 4

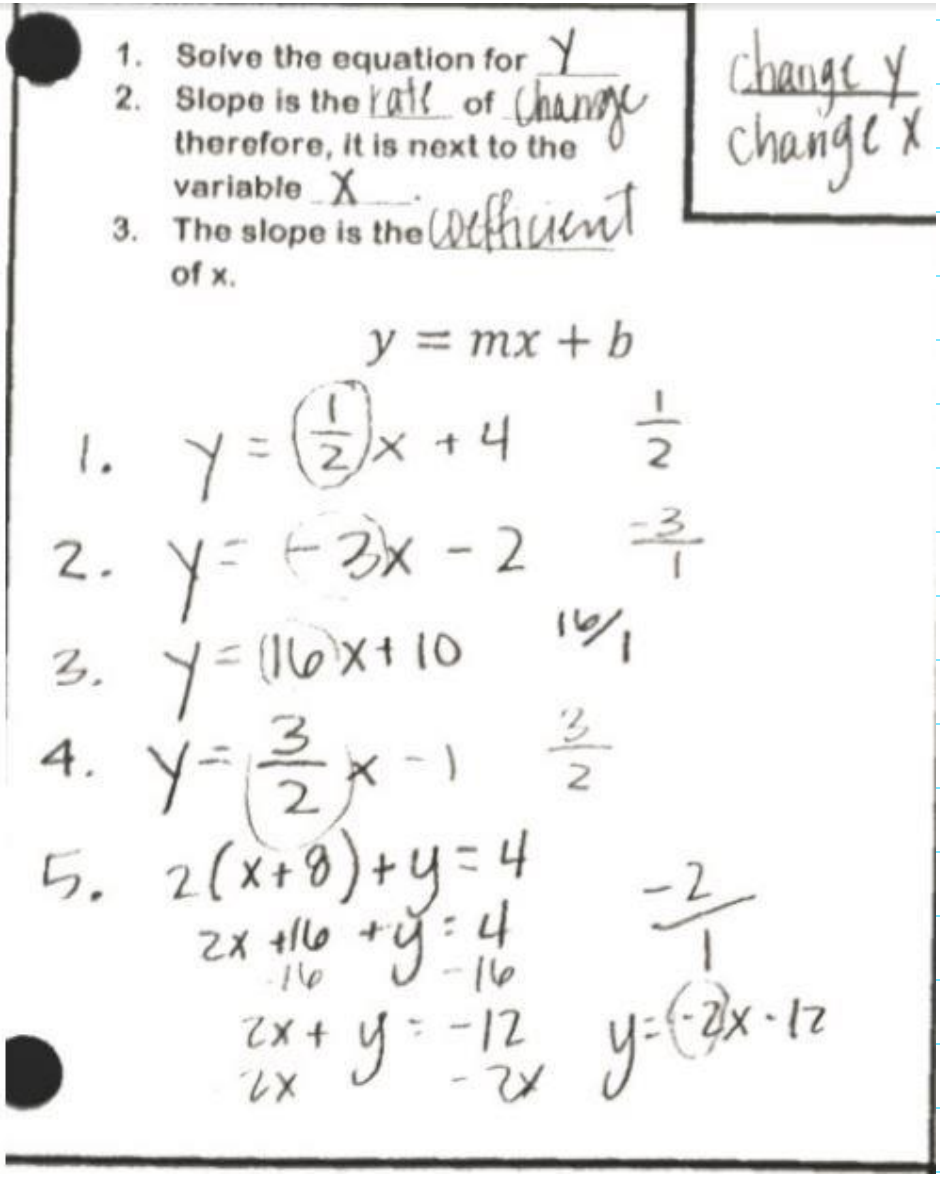
y=-3x -2

y=16x + 10

y=3/2x -1

*2(x+8)+ y= 4

Lesson 4.2 Understanding Slope Intercept Form (Day 1)



1. Solve the equation for Y
2. Slope is the rate of change therefore, it is next to the variable X.
3. The slope is the coefficient of x.

change Y / change X

$y = mx + b$

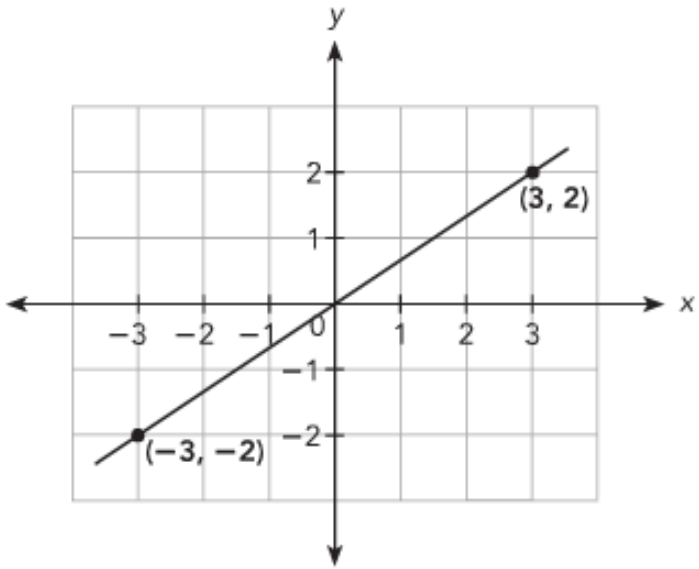
1. $y = \frac{1}{2}x + 4$ $\frac{1}{2}$
2. $y = -3x - 2$ $\frac{-3}{1}$
3. $y = 16x + 10$ $16/1$
4. $y = \frac{3}{2}x - 1$ $\frac{3}{2}$
5. $2(x+8) + y = 4$
   $2x + 16 + y = 4$
   $-16 \quad\quad -16$
   $2x + y = -12$
   $-2x \quad\quad -2x$
   $y = -2x - 12$ $\frac{-2}{1}$

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Write an equation in the form $y = mx$ or $y = mx + b$ for each line.

Example 6- Find Slope using a graph

a)



1. Find two coordinate points
2. Use slope formula to find slope of line

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

3. Locate y-intercept (0,2)
4. Substitute the value of and b in the equation y=mx or y = mx+b

1.

2.

3.

4.

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Solution

The line passes through the points $(-3, -2)$ and $(3, 2)$.

$$\text{Slope } m = \frac{2 - (-2)}{3 - (-3)} = \frac{4}{6} = \frac{2}{3}$$

The line passes through the y-axis at the point $(0, 0)$.

So, the y-intercept, b, is 0.

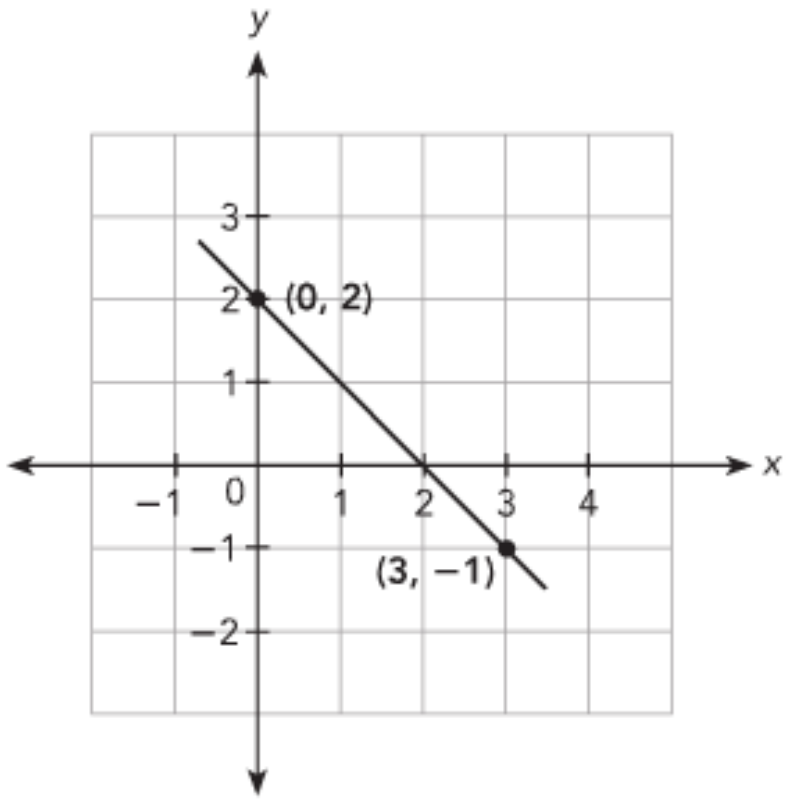
Slope-intercept form: $y = \frac{2}{3}x + 0$ Substitute the values of m and b.

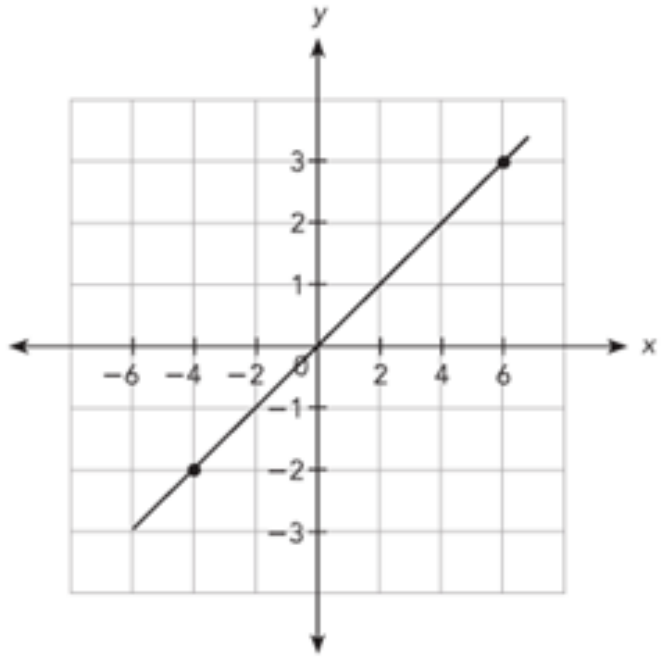
$y = \frac{2}{3}x$ Simplify.

So, an equation of the line is $y = \frac{2}{3}x$.

Lesson 4.2 Understanding Slope Intercept Form (Day 1)

b)





Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Solution

The line passes through the points (0, 2) and (3, −1).

Slope $m = \frac{-1 - 2}{3 - 0}$

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

$= -1$

The line intersects the y-axis at the point (0, 2).
So, the y-intercept, b, is 2.

Slope-intercept form: $y = (-1)x + 2$ Substitute the values of m and b.

$y = -x + 2$ Simplify.

So, an equation of the line is $y = -x + 2$.

The line passes through the points (__?__, __?__)

and (__?__, __?__). −4; −2; 6; 3

Slope $m = \frac{? - ?}{? - ?}$ $\frac{3 - (-2)}{6 - (-4)}$ or $\frac{-2 - 3}{-4 - 6}$

$= \frac{?}{?}$ $\frac{5}{10}$ or $\frac{-5}{-10}$

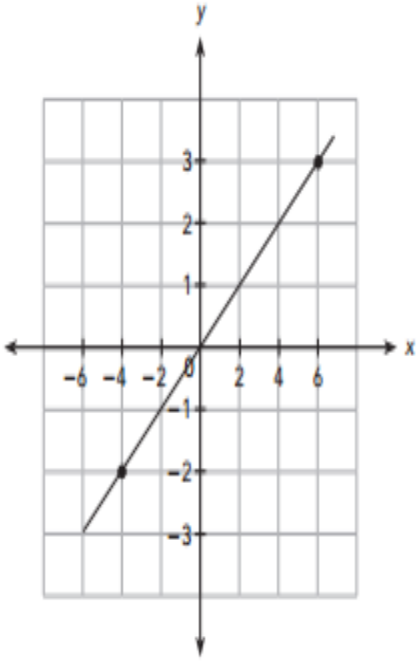
$=$ __?__ $\frac{1}{2}$

The line intersects the y-axis at the

point (__?__, __?__). 0; 0

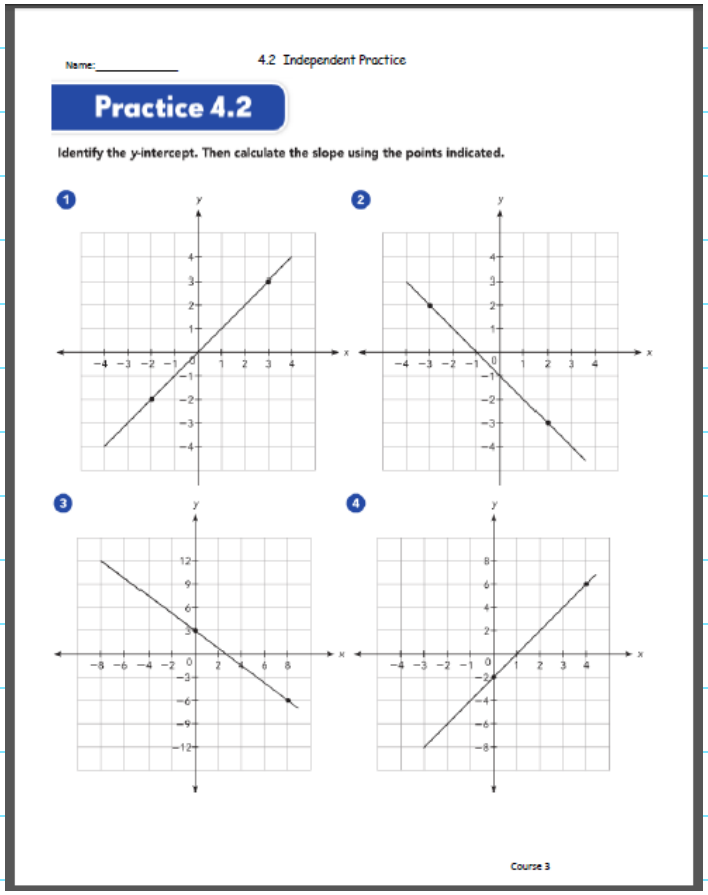
So, the y-intercept is __?__. 0

So, the equation of the line is __?__. $y = \frac{1}{2}x$



Lesson 4.2 Understanding Slope Intercept Form (Day 1)

Independent Practice #1-4



Name: _____ 4.2 Independent Practice

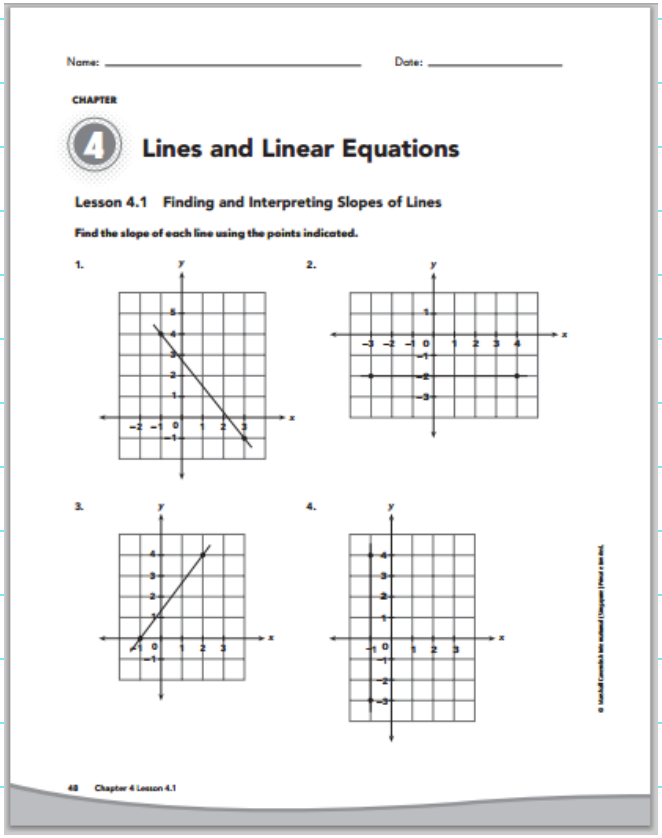
Practice 4.2

Identify the *y*-intercept. Then calculate the slope using the points indicated.

1.
2.
3.
4.

Course 3

Wednesday/Thursday Hmwk



Name: _____ Date: _____

CHAPTER 4

Lines and Linear Equations

Lesson 4.1 Finding and Interpreting Slopes of Lines

Find the slope of each line using the points indicated.

1.
2.
3.
4.

48 Chapter 4 Lesson 4.1

Lesson Check – Write Slope of line using formula y=mx+b