

Name: KEY
Date: June 2017

Review Final Math 620
FINAL REVIEW PACKET #2

Complete the packet by working each question. Correct your packet using the answer key (posted on class website www.nshsdolan.weebly.com)
If a question is incorrect, go back and try to find your mistake. Make your life easier by showing all your steps!

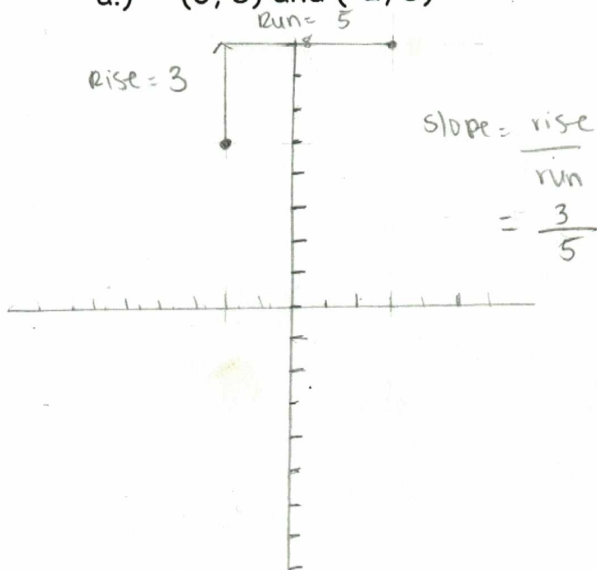
LINEAR EQUATIONS and GRAPHS

Describe two methods, one algebraic and one visual (on a graph paper for example), for finding the slope between two points on a line.

Algebraic	Visual
If have two points, (x_1, y_1) and (x_2, y_2)	
then	
$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$	
	Slope = $\frac{\text{rise}}{\text{run}} = \frac{3}{1}$

1. Find the slope of the line between the two points. You may use the slope formula or plot the points on graph paper and find the slope visually.

a.) $(3, 8)$ and $(-2, 5)$



b.) $(6, 2)$ and $(20, -3)$

$$m = \frac{2 + (+3)}{20 - 6} = \frac{5}{14}$$

2. Slope-Intercept form of a line is $y = mx + b$. Which is the slope? Which is the y-intercept? What does each represent?

$$y = mx + b$$

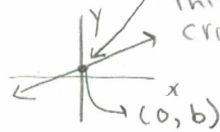
$m = \text{slope}$

Slope represents the rate of change, $\frac{\text{rise}}{\text{run}}$

$b = \text{y-intercept}$

y-intercept represents the starting point.

This is the point where the line crosses (intercepts the y-axis).



3. Write the equation of a line, in slope-intercept form, with slope of 3 passing through $(-1, 4)$. Remember that you must SOLVE for the y-intercept.

Slope-intercept form $\rightarrow y = mx + b$

Slope = $m = 3$

$$y = 3x + b$$

Know point $(-1, 4)$ is on the line

When $x = -1$, $y = 4 \dots$

$$-4 = 3(-1) + b$$

$$-4 = -3 + b$$

$$7 = b$$

y-intercept = $b = 7$

Point $(0, 7)$

Final equation:
 $y = 3x + 7$

4. Write the equation of a line, in slope intercept form passing through $(10, 9)$ and $(5, 7)$. Remember that you must SOLVE for the y-intercept.

Find slope of line between points $(10, 9)$ and $(5, 7)$

$$m = \frac{9-7}{10-5} = \frac{2}{5}$$

Slope-intercept form: $y = mx + b$

$$y = \frac{2}{5}x + b$$

Use either point $(10, 9)$ or $(5, 7)$

to solve for y-intercept

$$7 = \frac{2}{5}\left(\frac{5}{1}\right) + b$$

$$7 = 2 + b$$

$$-2 \quad -2$$

$$b = 5$$

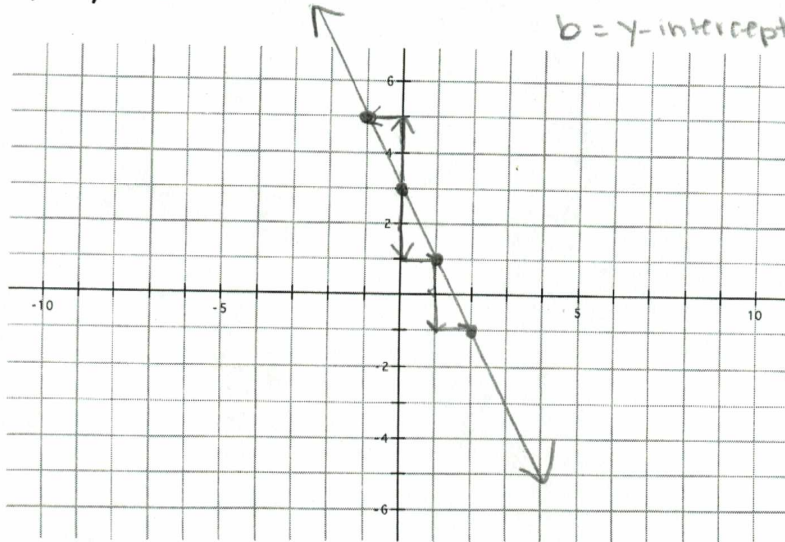
Final equation

$$y = \frac{2}{5}x + 5$$

5. Graph each of the following equations. You may use a table of values.
 (HINT: Start with your starting point and use the slope to find other points that fall on the same line.)

a.) $y = -2x + 3$

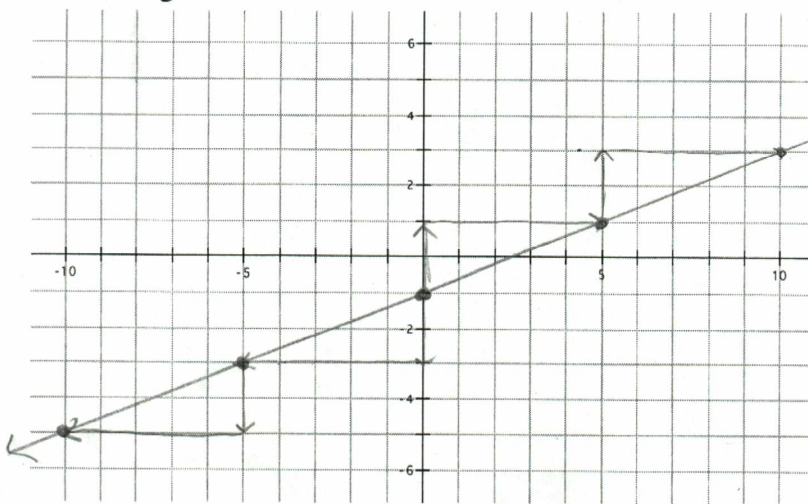
$m = \text{slope} = \frac{-2}{1}$ → down two, right one
 → up two, left one
 $b = y\text{-intercept} = 3$ → line crosses y-axis at point (0, 3).



x	y
-1	5
0	3
1	1
2	-1

b.) $y = \frac{2}{5}x - 1$

$m = \text{slope} = \frac{2}{5}$
 $b = y\text{-intercept} = -1$

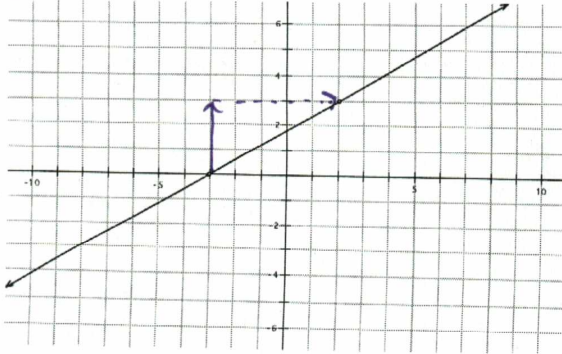


x	y
-10	-5
-5	-3
0	-1
5	1

6. Find the equation of each line. Identify the slope and the y-intercept for each.

★ Remember! Horizontal line has a slope of 0!

a.)



Slope:

$$\frac{\text{rise}}{\text{run}} = \frac{\text{up } 3}{\text{right } 5} = \frac{3}{5}$$

Y-intercept: Point on line $(-3, 0)$

Use point to solve for y-intercept

$$y = \frac{3}{5}x + b$$

$$0 = \frac{3}{5}(-3) + b$$

$$0 = \frac{-9}{5} + b$$

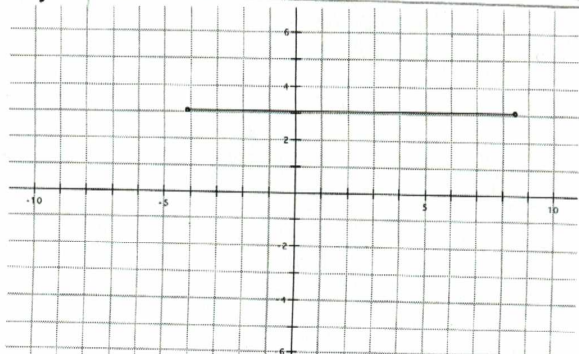
y-intercept is point $(0, \frac{9}{5})$

$$\frac{9}{5} = b$$

Equation:

$$y = \frac{3}{5}x + \frac{9}{5}$$

b.)



Slope: NO rise means rise = 0

$$\frac{\text{rise}}{\text{run}} = \frac{0}{\text{run}}$$

0 divided by any number equals 0!

Therefore slope = 0

Y-intercept:

Line crosses y-axis at point $(0, 3)$

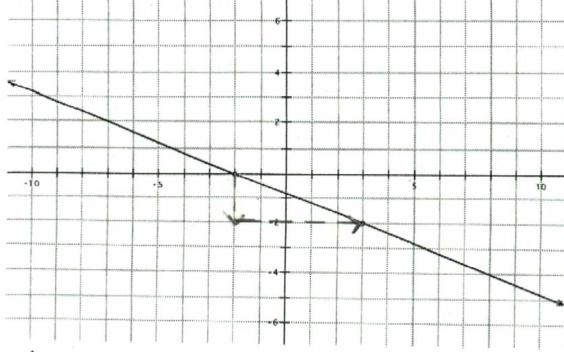
Therefore y-intercept = $b = 3$.

Equation:

$$y = 0 \cdot x + 3$$

$$y = 3$$

c.)



Slope: $\frac{\text{Rise}}{\text{Run}} = \frac{\text{Down } 2}{\text{Right } 5} = \frac{-2}{5}$

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

Y-intercept: Solve for y-intercept.

$(-2, 0)$ is point on line

$$0 = \frac{-2}{5}(-2) + b$$

$$0 = \frac{4}{5} + b$$

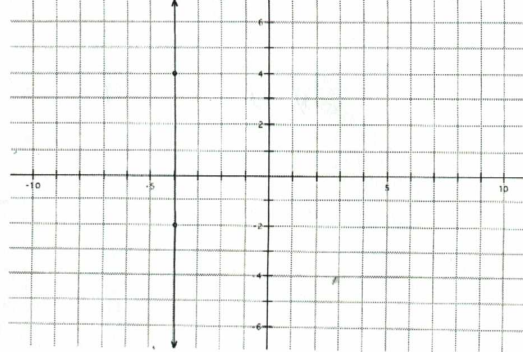
$$\frac{-4}{5} = b$$

Equation:

$$y = -\frac{2}{5}x - \frac{4}{5}$$

y-intercept = $(0, -\frac{4}{5})$

d.)



Slope: No run (vertical line)

$$\text{Run} = 0$$

$$\text{Slope} = \frac{\text{rise}}{0}$$

* Any number divided by zero = UNDEFINED!

Slope = undefined

Y-intercept:

NO y-intercept

(does not cross y-axis)

Equation:

$$x = -4$$