Math 20 Unit 2 4.1 to 4.8, 5.1 to 5.3

To the Test – be sure to bring:

(1) your personally-prepared 8 ½ " by 11" study guide for this test
(2) your simple, non-graphing calculator and
(3) your pencils
(4) your BluGold ID

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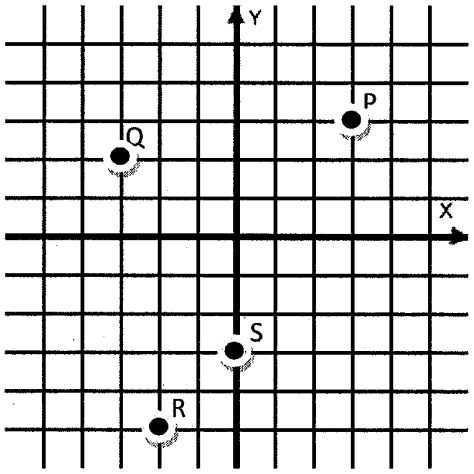
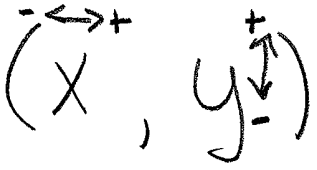
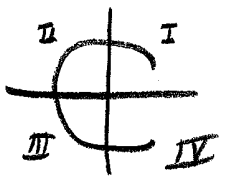
1. Give the coordinates of points P, Q, R, and S with an ordered pair and then identify the quadrant in which each point lies.

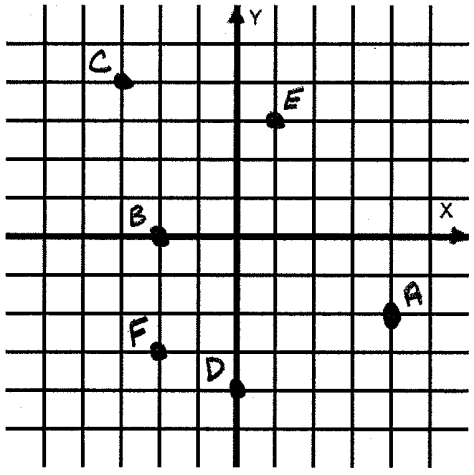


	Coordinates	Quadrant
P	(3, 3)	I
Q	(-3, 2)	II
R	(-2, -5)	III
S	(0, -3)	none, on axis





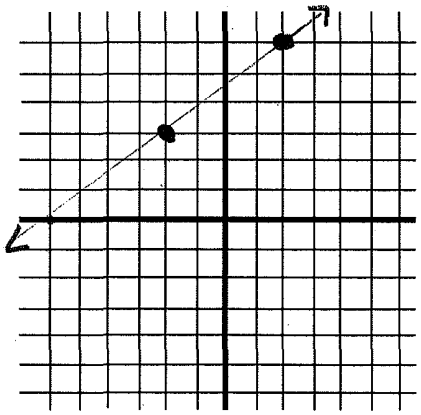
2. Graph and label the points corresponding to A (4, -2), B (-2, 0), C (-3, 4), D (0, -4), E (1, 3), F (-2, -3)



3. Identify a second point on the line containing the point $(-2,3)$ and with the slope $m=\frac{3}{4}$, then graph the line. Second Point: (2 , 6) Graph: (means draw it)

$(-2,3)$ $+4$ $+3$ $(2,6)$

$m = \frac{3}{4}$ ← change y / change x



4. Graph the line containing the point $(-4,2)$ and with the slope $m = undefined$

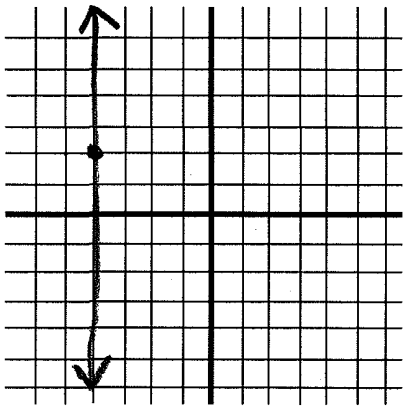
m = undefined

$\frac{y}{0}$ ← no change in x

means is a vertical line

$x = -4$

Graph:



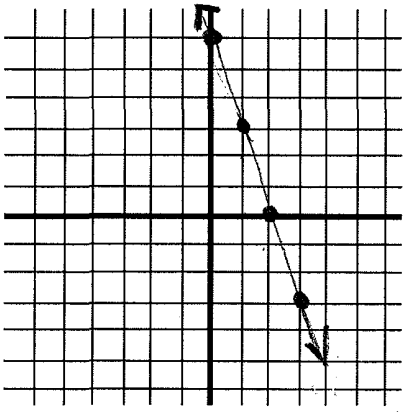
If m was $\emptyset$ would be a horizontal line.

5. Given the *standard form* of the equation of a line: $3x + y = 6$

form $y = mx + b$ (slope, intercept $(0,b)$)

(a) Give the *slope-intercept form* of the line: $y = -3x + 6$

(b) State the y-intercept point: (0 , 6) and (c) Graph the line:



plot $(0,6)$

slope $= \frac{-3}{1}$ down 3 over 1

to next point

formula came from $m = \frac{y - y_1}{x - x_1}$

6. Write the equation of the line, in *slope-intercept form*, of a line containing the point $(0, 2)$ and with the slope $m = -3$

use point-slope $y - y_1 = m(x - x_1)$

$y - 2 = -3(x - 0)$

$y - 2 = -3x + 0$

$\boxed{y = -3x + 2}$

since we had the slope and the intercept we could just write

$y = -3x + 2$

↑ slope ↑ 'b' value of intercept (0, 2)

Write the equation of the line, in *slope-intercept form*, of a line containing the point $(4, 0)$ and with the slope $m = 3$

$y - 0 = 3(x - 4)$

$\boxed{y = 3x - 12}$

7. Use the point-slope formula to find the 'b' value in the equation of the form $y = mx + b$ of a line containing the points: $(5, -6)$ and $(1, 0)$

have points, no slope

need slope first: $\frac{-6 - 0}{5 - 1}$ $\frac{\text{change in } y\text{'s}}{\text{change in } x\text{'s}}$ $\frac{y_2 - y_1}{x_2 - x_1}$

$\frac{-6}{4} = -3/2$

select either point

$y - 0 = -3/2(x - 1)$

$\boxed{y = -\frac{3}{2}x + \frac{3}{2}}$

or $y - -6 = -\frac{3}{2}(x - 5)$

$y + 6 = -\frac{3}{2}x + \frac{15}{2}$

$y = -\frac{3}{2}x + \frac{15}{2} - 6$

$y = -\frac{3}{2}x + 3/2$

8. First, find the slope of the line L: $6x-7y=14$ Slope of Line L is : $\frac{6}{7}$

$\frac{-7}{-7}y = \frac{-6x}{-7} + \frac{14}{-7}$ $y = \frac{6}{7}x - 2$

Next, write the equation of a line, in ~~slope-intercept~~ form, that is **parallel** to line L and passing through the point $(0,-6)$. Express any fractions as simplified, improper fractions if necessary.

parallel ... same slope $\frac{6}{7}$

$y-^{-}6 = \frac{6}{7}(x-0)$

$y+6 = \frac{6}{7}x$

$y = \frac{6}{7}x - 6$

or we have $(0,-6)$ ↑ intercept

$y = \frac{6}{7}x - 6$ ↓ intercept

slope

9. Finally, write the of an equation of a line, in slope-intercept form, that is perpendicular to line L and passing through the point $(0,-6)$. Express any fractions as simplified, improper fractions if necessary.

perpendicular slope is negative reciprocal

$-\frac{7}{6}$

$y = -\frac{7}{6}x - 6$

$(0,-6)$ ↑ intercept

10. Consider the following three relations. For each, determine if the relation is a function (y as a function of x) and, if it is a function, state the domain of the function.

$y = x+4$

yes
unique y for each x

domain
{all Reals}
$(-\infty, \infty)$

$y = \frac{3}{2x-16}$

yes
unique y for each x
can't use 8
will make division by 0
$(-\infty, 8) \cup (8, \infty)$
all except 8

$y^2 - 3 = x$

NO
for example
$(2)^2 - 3 = 1$
$(-2)^2 - 3 = 1$
there is NOT a unique y for a given x.

11. Let $f(x) = -4x - 6$. Find $f(3)$

$f(3) = -4(3) - 6$

$= -12 - 6$

$= \boxed{-18}$

Let $k(n) = n + 9$. Find $k(8)$

$K(8) = 8 + 9$

$= \boxed{17}$

12. Let $f(x) = -4x - 6$. When a certain value V was used for x, the result was 2.

Find the value of V when $f(V) = 2$

$f(V) = 2$

$f(V) = -4V - 6$

so $-4V - 6 = 2$

$+6 \quad = +6$

$\frac{-4V}{-4} = \frac{8}{-4}$

$\boxed{V = -2}$

$f(-2) = ?$

$-4(-2) - 6 = ?$

$8 - 6 = 2$

checks

Let $k(n) = n + 9$. Find a when $k(a) = 5$

$K(a) = 5$

$K(a) = a + 9$

$\boxed{a = -4}$

so $5 = a + 9$

$-9 \quad -9$

$-4 = a$

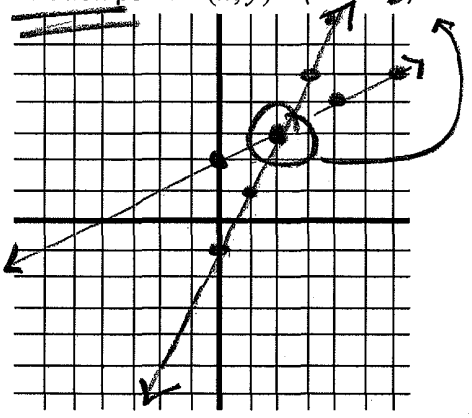
Three ways to solve:

13. Solve the system of equations by ***graphing***. Then, identify the solution point.

$$y = \frac{1}{2}x + 2$$

$$y = 2x - 1$$

Solution point: $(x, y) = (\ 2\ ,\ 3\ )$



$y = \frac{1}{2}x + 2$ plot $(0, 2)$ then up 1, over 2

$y = 2x - 1$ plot $(0, -1)$ then up 2, over 1

3 possible Results:
1) intersect → point
2) parallel → NO solution
3) same → all points on the line

14. Solve the system using the ***substitution*** method.

$$x + 3y = -12$$

$$3x + 4y = -6$$

Solution point: $(x, y) = (\ 6\ ,\ -6\ )$

1) isolate one variable
$x = -3y - 12$
2) substitute in other equation

$3(-3y - 12) + 4y = -6$
$-9y - 36 + 4y = -6$
$-36 - 5y = -6$
$+36 \quad = +36$
$-5y = 30$

$\frac{-5y}{-5} = \frac{30}{-5}$
$y = -6$
now solve for x

$x + 3(-6) = -12$
$x - 18 = -12$
$+18 = +18$
$x = 6$

15. Solve the system using the ***substitution*** method.

$$6y - x = 5$$

$$-24y = -4x - 20$$

$6y - 5 = x$

Solution point: $(x, y) = (\ \text{all points on the line}\ )$

$-24y = -4(6y - 5) - 20$
$-24y = -24y + 20 - 20$
$\frac{-24y}{-24} = \frac{-24y}{-24}$
$y = y$
$0 = 0$ completely TRUE

so any point worked

$\{(x, y) \mid 6y - x = 5\}$

16. Solve the system by using the ***elimination*** method.

$3x+4y=9$

$5x+6y=19$

Solution point: $(x,y)=($ 11 , -6 $)$

multiply by -5

multiply by 3

TRY to eliminate one of the variables

$-15x-20y=-45$

$15x+18y=57$

$-2y=12$

$y=-6$

$3(x)+4(-6)=9$

$3x-24=9$

$+24=+24$

$\frac{3}{3}x=\frac{33}{3}$

$x=11$

17. Solve the system by using the ***elimination*** method.

$3x+4y=9$

$16-3x=4y$

Solution point: $(x,y)=($, $)$

must line up x's and y's

$3x+4y=9$

$-3x-4y=-16$

$0+0=-7$

$0=-7$

FALSE

so NO solution

$\varnothing$