Intermediate Algebra

Name: _____

Per: _____

Chapter 2 Review

1) Given the mapping below, show the relationship in each of the following representations and answer the questions below.

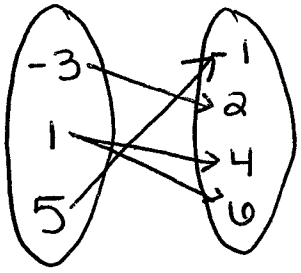
Ordered Pairs

$(-3,2),(1,4),(1,6),(5,-1)$

Table of values

x	-3	1	1	5
y	2	4	6	-1

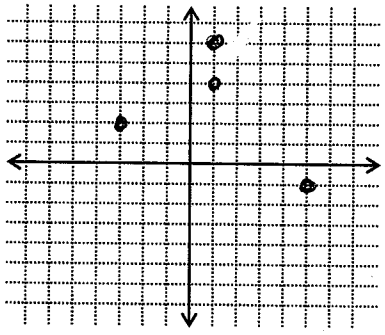
Mapping



Domain: $\{-3,1,5\}$

Range: $\{-1,2,4,6\}$

Graph

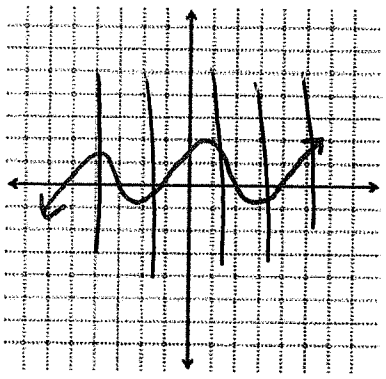


Is it a function? Why or why not?

no! does not pass the vertical line test and 1 input value has more than 1 output value

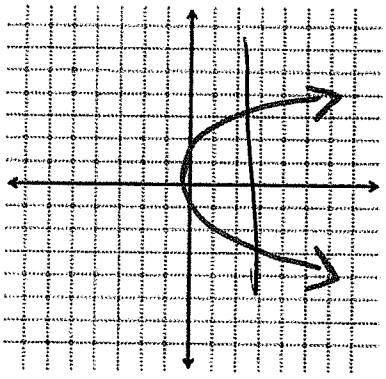
2) Determine whether the following graphs are functions.

a.



yes!

b.



no!

3) You are saving money to buy a new bike. The bike costs $300. You have already saved $100 and you save $20 each week.

S = savings
w = week

a. Develop a mathematical model for your savings (S). $S(w) = 20w + 100$

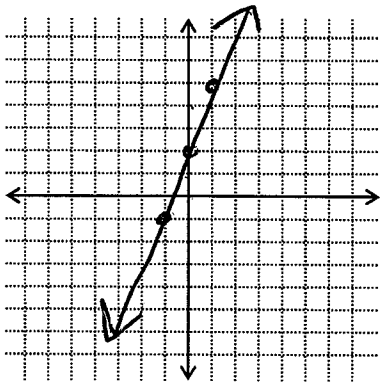
b. How much will you have saved after 6 weeks? $S(6) = 20(6) + 100 = \$220$

c. Explain what S(4) = 180 means in the context of this problem.

After 4 weeks, you have saved a total of $180.

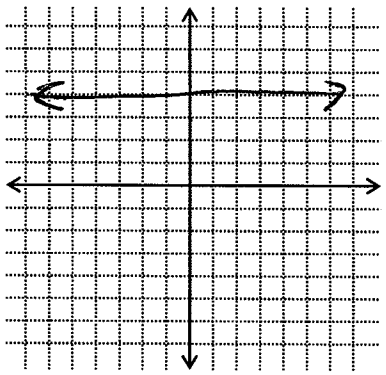
Graph the following equations. Make sure you are able to identify the slope and y-intercept for each one!

4) $y = 3x + 2$



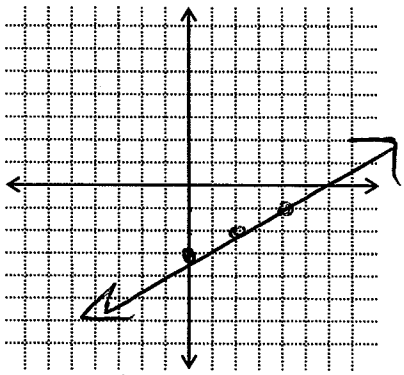
m=3 b=2

5 $y = 4$ horizontal line!



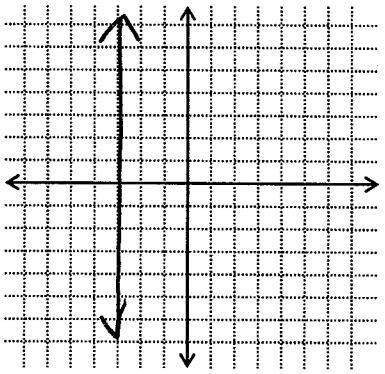
m=0 b=4

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



$m = \frac{1}{2}$ b=-3

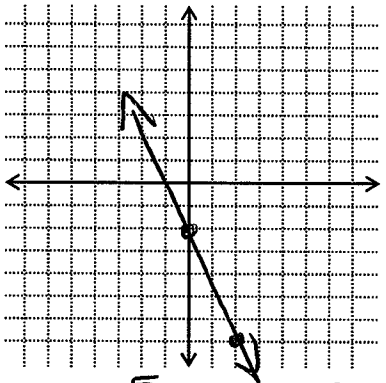
7) $x = -3$ vertical line!



m=undefined

b= none

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

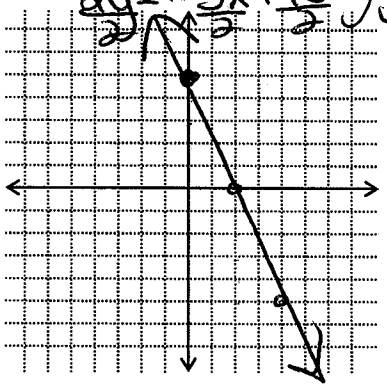


$m = -\frac{5}{2}$ b=-2

9) $5x + 2y = 10$

$-5x \quad -5x$

$\frac{2y}{2} = \frac{-5x}{2} + \frac{10}{2}$ $y = -\frac{5}{2}x + 5$



10) Find the x and y intercepts for each of the following.

a. $3x - 6y = 18$

x-int

$3x - 6(0) = 18$

$\frac{3x}{3} = \frac{18}{3}$

$x = 6$

y-int

$3(0) - 6y = 18$

$\frac{-6y}{-6} = \frac{18}{-6}$

$y = -3$

x-int: (6,0) y-int: (0,-3)

b. $y = -4x + 8$

x-int

$0 = -4x + 8$

$-8 \quad -8$

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

$x = 2$

y-int

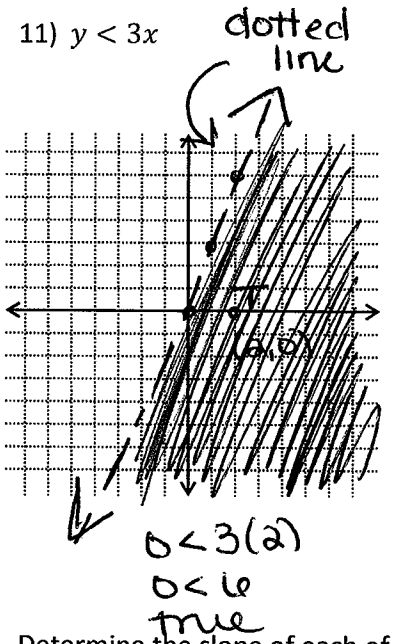
$y = -4(0) + 8$

$y = 8$

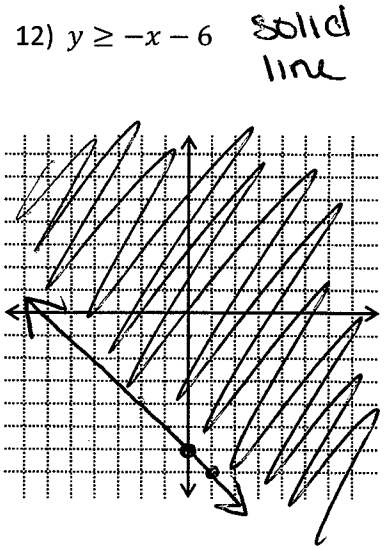
x-int: (2,0) y-int: (0,8)

Graph the following linear inequalities. Don't forget to **SHADE**!

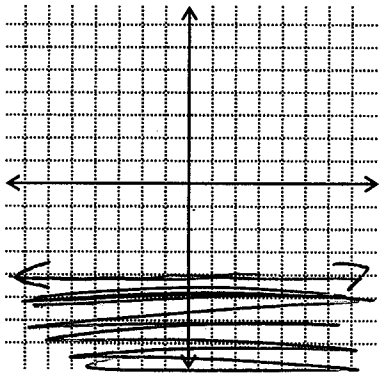
11) $y < 3x$



12) $y \geq -x - 6$



13) $y \leq -4$



Determine the slope of each of the following problems.

simplify

14) (3, -20) and (5, 8)

$$m = \frac{8-(-20)}{5-3} = \frac{28}{2}$$

$m = 14$

15) (19, -2) and (-11, 10)

$$m = \frac{10-(-2)}{-11-19} = \frac{12}{-30}$$

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

16) (17, -13) and (17, 8)

$$m = \frac{8-(-13)}{17-17} = \frac{21}{0}$$

$m =$ undefined

17) A car that costs \$19,000 in 2003 was sold for \$10,200 in 2007. Find the **average rate of change** in the car's value.

(2003, 19,000) (2007, 10200)

slope

time is almost always x

$$m = \frac{10200-19000}{2007-2003} = -\frac{8800}{4} =$$ decreases \$2,200 in value each year

Be able to write the equation of the line in slope intercept form given the following information.

18) $m = \frac{1}{4}$ and passes through (-12, 3)

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

$b = 6$

$y = mx + b$

$3 = \frac{1}{4}(-12) + b$

$3 = -3 + b$

$+3 \quad +3$

$6 = b$

$y = \frac{1}{4}x + 6$

19) (-2, 3) and (2, -5)

$$m = \frac{-5-3}{2-(-2)} = \frac{-8}{4} = -2$$

$m = -2$

$b = -1$

$3 = -2(-2) + b$

$3 = 4 + b$

$-4 \quad -4$

$-1 = b$

$y = -2x - 1$

20) Write the equation of the line that passes through (1, 7) and is parallel to $y = 3x - 15$.

$m = 3$

$b = 4$

$7 = 3(1) + b$

$7 = 3 + b$

$-3 \quad -3$

$4 = b$

$y = 3x + 4$

21) Write the equation of the line that passes through the point (-4, 3) and is perpendicular to the line $y = 2x$.

$m = -\frac{1}{2}$

$b = 1$

$3 = -\frac{1}{2}(-4) + b$

$3 = 2 + b$

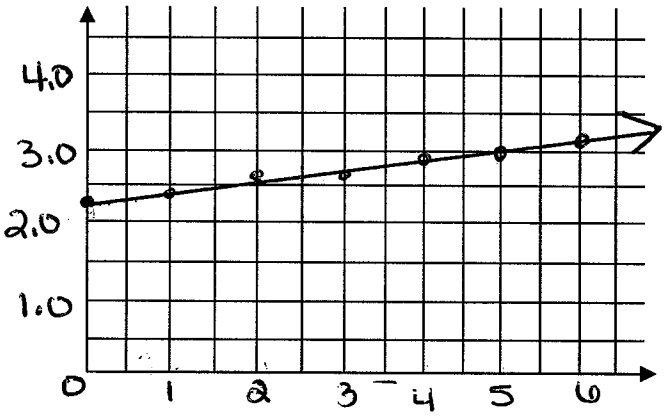
$-2 \quad -2$

$1 = b$

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

22) Draw a scatter plot of the data in the table below.

x	0	1	2	3	4	5	6
y	2.3	2.4	2.6	2.6	2.9	3.0	3.2



Is there positive, negative, or relatively no correlation?

positive

Use the calculator to find the line of best fit.

$y = .15x + 2.26$

Finding the line of best fit by hand:

1. Draw a line that most closely models the data.

2. Pick two points on the line and use those to write the equation of a line. (Find the slope and then use point-slope form to write the equation)

(1, 2.4)

(5, 3.0)

$m = \frac{3 - 2.4}{5 - 1} = \frac{.6}{4} = .15$

$3 = .15(5) + b$

$3 = .75 + b$

$-.75 \quad -.75 + b$

$b = 2.25$

$y = .15x + 2.25$

Use the line of best fit to predict the value of y when x = 9.

$y = .15(9) + 2.25$

$= 3.6$

your equation might not be the same