Name: _____ Date: _____ Hour: __Alg 1__

Unit 3b Day21: Review Linear Functions

Focus Question: Am I ready for my test?

1. The table shows the growth of one pig raised on a farm.

Average Growth of a Properly Fed Pig

x	Age (mo)	0	1	2	3	4	5	6
y	Weight (lb)	3	48	92	137	182	228	273

Source: Your 4-H Market Hog Project, Iowa State University.

a. On the graphing calculator, make a graph of the (age, weight) data. Which variable is independent? Age

b. Is the relationship between age and weight linear or non-linear? Linear

c. Estimate the correlation coefficient? r = .99 Positive Strong

d. Using the points (5, 230) and (3, 140) find the slope and explain what it tells you about the pig's growth.

$\frac{\Delta y}{\Delta x} \frac{230-140}{5-3} = \frac{90}{2}$ m = 45 The pig's weight increases by 45 pounds every month.

e. Find the equation of the line using linear regression on the TI – 84.

hundredths

What is the equation? $y = 45x + 2.57$ What is the actual correlation coefficient? $r \approx 0.99998$

f. What would the pig's weight be at 1 year old? Is this interpolation or extrapolation? 542.57 pounds (table) 1yr. is not in the domain

2. Find the equation in function notation for each situation below.

a) Slope is ½ and y intercept is (0, -3) f(x) $f(x) = \frac{1}{2}x - 3$

b) through the point (4, -6) with a slope of 6

$y = mx + b$

$y + 6 = 6(x - 4)$

$y + 6 = 6x - 24$

$-6 \quad -6$

$f(x) = 6x - 30$

c) through the points (-1, 4) and (5, -8)

$m = \frac{-8-4}{5--1} = \frac{-12}{6}$ m = -2

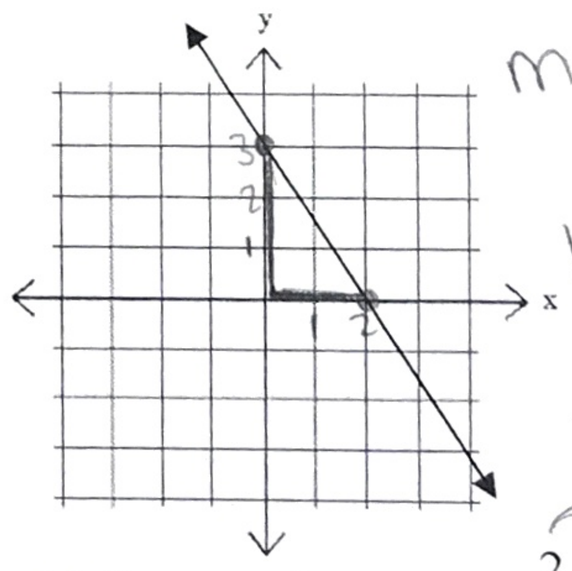
$y - 4 = -2(x + 1)$

$y - 4 = -2x - 2$

$+4 \quad +4$

$f(x) = -2x + 2$

d)



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

b = 3

$f(x) = -\frac{3}{2}x + 3$

e. A line with the equation $8x - 2y = 16$

$-8x \quad -8x$

$\frac{-2y}{-2} = \frac{-8x}{-2} + \frac{16}{-2}$

$y = 4x - 8$

$f(x) = 4x - 8$

f. a line with the equation $y - 3 = \frac{2}{3}(x + 5)$

$y - 3 = \frac{2}{3}x + \frac{10}{3}$

$+3 \quad +\frac{9}{3}$

$f(x) = \frac{2}{3}x + \frac{19}{3}$

g. The function with the table below

$\Delta x: +2$

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

$\Delta y: -3$

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

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

$f(x) = -\frac{3}{2}x - \frac{1}{2}$

3. A bus company charges passengers a ticketing fee of $12 as well as $0.50 for each mile traveled.

yint

a. Write a function relating the cost of the trip, c, based on the number of miles, n.

$C(n) = .5n + 12$

b. Using your equation in part a, find the cost of the trip if Maggie traveled 140 miles.

$C(140) = .5(140) + 12$

$C(140) = 82$

$82

c. If Maggie has $300, what is the farthest she can travel?

$300 \geq .5n + 12$ or $.5n + 12 \leq 300$

$-12 \quad -12$

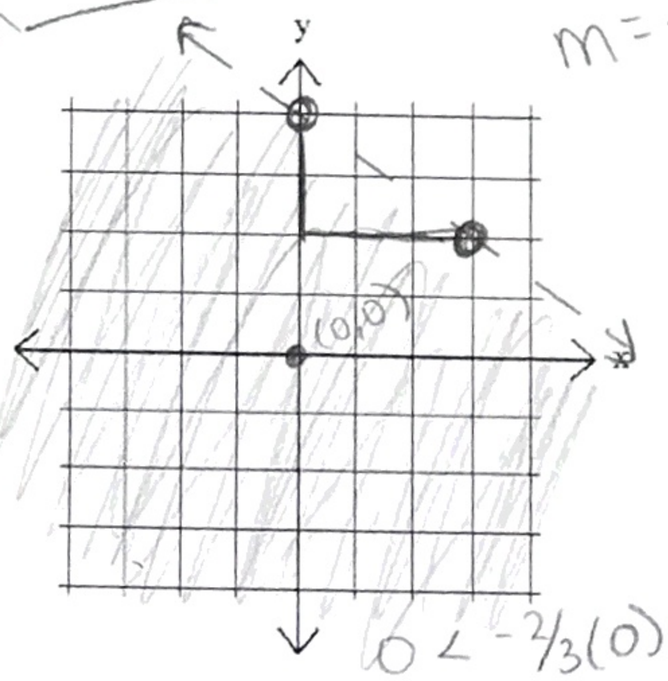
$\frac{.5n}{.5} \leq \frac{288}{.5}$

$n \leq 576$

2. Graph the following equations or inequalities

a. $y < -2/3x + 4$ $b = 4$ $m = -\frac{2}{3}$

dash



$0 < -2/3(0) + 4$

$0 < 0 + 4$

$0 < 4$ True

b. $3x - 4y \geq 8$

isolate solid

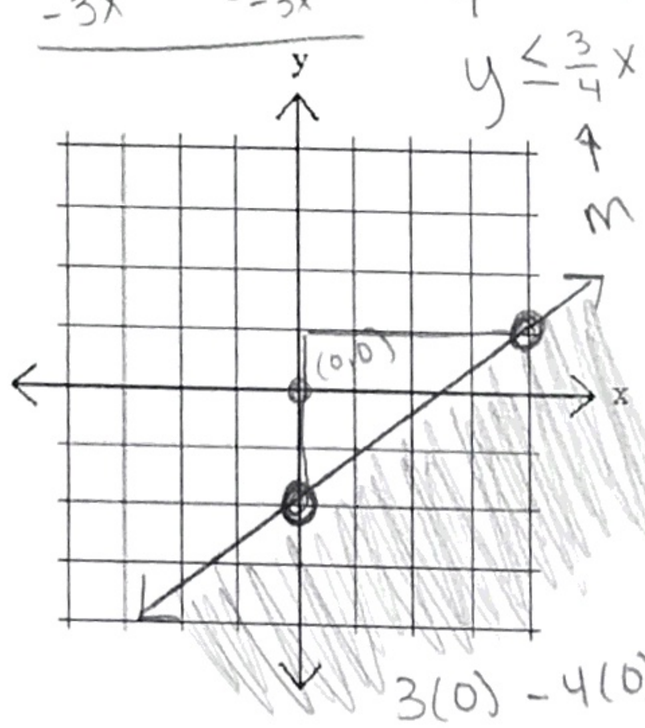
$-3x \quad -3x$

$\frac{-4y}{-4} \geq \frac{-3x + 8}{-4}$

$y \leq \frac{3}{4}x - 2$

b

m

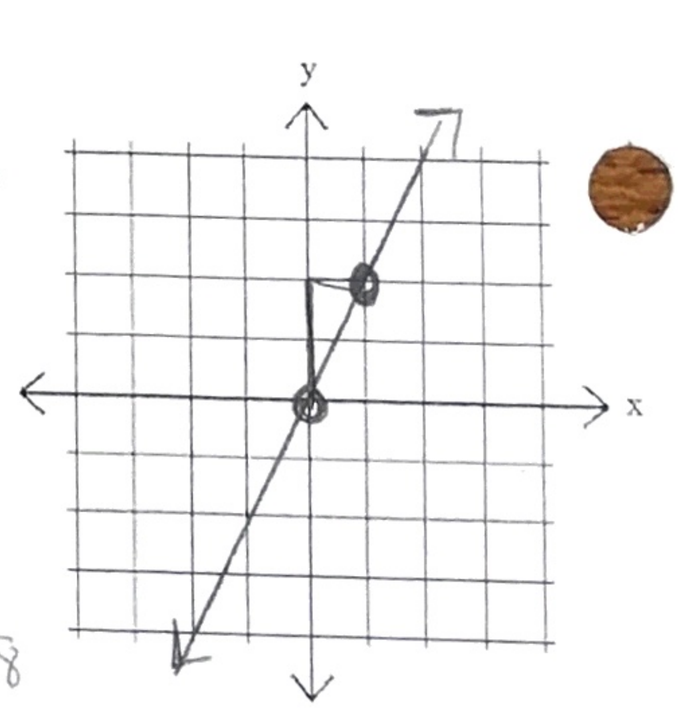


$3(0) - 4(0) \geq 8$

$0 - 0 \geq 8$

$0 \geq 8$ False

c. $y = 2x + 0$



3. Let $B(d) = -\frac{5}{2}d + 200$ represent the balance, B, in Coach Thompson's lunch account after d days.

a. How much money did Coach Thompson originally put in his account to start the year? $200

yint

b. How much does lunch cost teachers every day? $2.50

slope $\frac{5}{2}$

c. Find the x – intercept. What does this value represent?

happens when y is 0

$B(d) = 0$

$0 = -\frac{5}{2}d + 200$

$-200 \quad -200$

$-\frac{2}{5} \cdot -200 = -\frac{5}{2}d \cdot -\frac{2}{5}$

$80 = d$

After 80 days he is out of $

d. Find B(12). What does it represent?

$B(12) = -\frac{5}{2}(12) + 200$

$B(12) = -30 + 200$

$B(12) = 170$

The balance after 12 days is $170.