IAG 1 – Holleran
Unit 4: Linear Eqs and Systems Pt 1
Quiz/Test Tab

Name: _____

Quiz 5 Review: Multivariable Functions

Label each of the following functions as linear, exponential, or inverse.

1. $z = 2.5h$ — Linear

2. $y = \frac{1{,}000}{x}$ — Inverse

3. $y = 0.5^x$ — exponential

4. $45 = \frac{z}{y}$ — Linear ($z = 45y$)

5. $y = 25 - 3x$ — Linear

6. $B = 50(2^t)$ — exponential

7. Tamika pays $0.08 a minute for any daytime, weekday long-distance calls she makes and $0.04 a minute for night and weekend long-distance calls she makes.

   a.) Tamika's long-distance bill B depends on the number of daytime minutes d and the number of night/weekend minutes w she uses. Write a rule expressing B as a function of d and w.

   $B = 0.08d + 0.04w$

   b.) Tamika has budgeted a total of $10 per month for long-distance calls. Write an equation that represents the question "How many daytime minutes and how many night/weekend minutes can Tamika use and have her long-distance bill be exactly $10?"

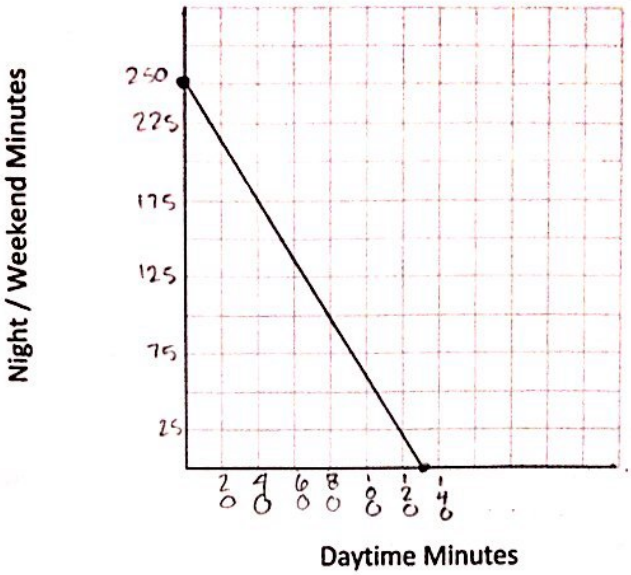
   $10 = 0.08d + 0.04w$

   c.) Find two (d, w) pairs of daytime and night/weekend minutes that are solutions to your equation in part b.

   $(0, 250)$

   $(125, 0)$

d.) Draw a graph that shows all of the possible solutions to your equation. Be sure to number your graph.



e.) What is the maximum number of long distance minutes that Tamika can use and not exceed her budget? When should she make calls in order to have to have the most minutes available to her?

250 weekend minutes

f.) Rewrite the equation 10 = 0.08d + 0.04w to express w as a function of d

$-0.08d \quad -0.08d$

$10 - 0.08d = 0.04w$

$\rightarrow w = 250 - 2d$

Now write the equation 10 = 0.08d + 0.04w to express d as a function of w.

$-0.04w \quad -0.04w$

$10 - 0.04w = 0.08d$

$\rightarrow d = 125 - 0.5w$

or $125 - \frac{1}{2}w$

8. Rewrite each of the following linear equations to express y as a function of x. Then, state the slope and y-intercept values. Show all work!

a. $2x + y = 6$

$-2x \quad -2x$

$y = 6 - 2x$ $\quad m = -2, \; b = 6$

b. $3x + 4y = 24$

$-3x \quad -3x$

$\frac{4y}{4} = \frac{24}{4} - \frac{3x}{4} \rightarrow y = 6 - \frac{3}{4}x$

$m = -3/4, \; b = 6$

c. $8x - 5y = 20$

$-8x \quad -8x$

$\frac{-5y}{-5} = \frac{20}{-5} - \frac{8x}{-5}$

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

$m = 8/5$

$b = -4$

d. $-4x - 3y = 15$

$+4x \quad +4x$

$\frac{-3y}{-3} = \frac{15}{-3} + \frac{4x}{-3}$

$y = -5 - \frac{4}{3}x$ $\quad m = -4/3$, $b = -5$

9. A local radio station sponsors a T-shirt and floppy hat drop during home pro basketball games. The T-shirts cost the radio station $10.50 each, and the hats cost $15 each.

a. The promotional cost C for the radio station depends on the numbers of shirts x and hats y given away at the game. Write a rule expressing C as a function of x and y.

$C = 10.50x + 15y$

b. How will the radio station's cost change as the number of shirts given away increases? How will cost change as the number of hats given away increases? *Be specific*

If shirt giveaways increases by 1, cost increases by $10.50

If hat giveaways incr. by 1, cost incr. by $15

c. Suppose the radio station has budgeted $1,500 per game for giveaways. Write an equation that represents the question "How many shirts and hats can the radio station give away for $1,500?"

$1500 = 10.50x + 15y$

d. Rewrite your equation from Part C to express y as a function of x.

$1500 = 10.50x + 15y$

$-10.50x \quad -10.50x$

$\frac{1500}{15} - \frac{10.50x}{15} = \frac{15y}{15} \rightsquigarrow 100 - 0.7x = y$ or $y = 100 - 0.7x$

e. List 4 (*shirts, hats*) solutions to your equation from Part c. ~~Draw a graph that shows all of the possible solutions.~~ Note: all values must be positive, whole numbers!

(20, 86) (0, 100)

(40, 72) (140, 2)

. Find the x- and y-intercepts for each equation below. Write answers as coordinate pairs.

a. $8x + y = 56$

$(0, 56)$ $y = 56$

$(7, 0)$ $8x = 56$

b. $12x + 20y = 420$

$(0, 21)$ $20y = 420$

$(35, 0)$ $12x = 420$

c. $-8x - 5y = 20$

$(0, -4)$ $-5y = 20$

$(-2.5, 0)$ $-8x = 20$

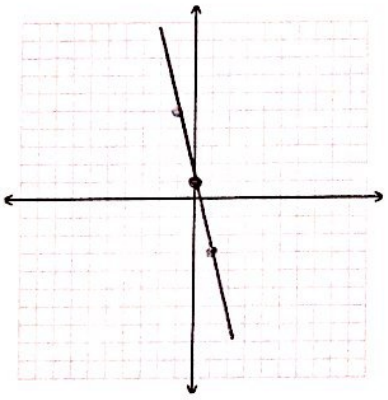
d. $4x - 6y = 54$

$(0, -9)$ $-6y = 54$

$(13.5, 0)$ $4x = 54$

11. Graph the following equations on the provided axes.

a. $y = -4x + 1$ $m = -4/1$, $\downarrow 4$, $\rightarrow 1$



b. $4x - 6y = 12$

Intercepts

$4x = 12 \rightsquigarrow (3, 0)$

$-6y = 12 \rightsquigarrow (0, -2)$