

2nd Trimester Test
Algebra

Name KEY Period _____

Solve the equation. Show each step completely. If the answer is not an integer, leave it as a *reduced improper fraction*. DECIMALS WILL NOT BE ACCEPTED.

1) $(-6) \frac{w}{6} = 7(-6)$

$w = -42$

2) $5p - 19 = -4$
 $+19 +19$

$\frac{5p}{5} = \frac{15}{5}$

$p = 3$

3) $\frac{r}{-2} - 11 = -7$
 $+11 +11$

$(-2) \frac{r}{-2} = 4(-2)$

$r = -8$

4) $(-\frac{3}{7}) \frac{7}{3} y = \frac{4}{13} (-\frac{3}{7})$

$y = -\frac{12}{91}$

5) $-3(4x - 8) = -1$

$-12x + 24 = -1$
 $-24 -24$

$\frac{-12x}{-12} = \frac{-25}{-12}$

$x = \frac{25}{12}$

6) $(-4) \frac{q+20}{-4} = -2(-4)$

$q + 20 = 8$
 $-20 -20$

$q = -12$

Write an algebraic equation for each problem, then solve it. Show all work.

7) The temperature fell by 11 degrees overnight and then tripled by noon to 66 degrees. What was the original temperature?

$$3(x-11) = 66$$

Equation

$$3(x-11) = 66$$

$$\begin{array}{r} 3x - 33 = 66 \\ +33 \quad +33 \\ \hline 3x = 99 \end{array}$$

$$\frac{3x}{3} = \frac{99}{3}$$

$$x = 33^\circ$$

8) You pay \$40 a month for Verizon wireless service plus \$.50 for every minute you go over your plan. Your bill was \$63. How many minutes did you go over?

$$.5x + 40 = 63$$

Equation

$$.5x + 40 = 63$$

$$\begin{array}{r} -40 \quad -40 \\ \hline .5x = 23 \\ \frac{.5x}{.5} = \frac{23}{.5} \end{array}$$

$$x = 46 \text{ min}$$

9) You want to go on a trip. Your plane ticket costs \$900 and you have \$3100 in savings. If you want to go for 30 days, how much can you spend each day?

$$30x + 900 = 3100$$

Equation

$$30x + 900 = 3100$$

$$\begin{array}{r} -900 \quad -900 \\ \hline 30x = 2200 \end{array}$$

$$\frac{30x}{30} = \frac{2200}{30}$$

$$x = 73.33$$

$$\$73.33 \text{ a day}$$

10) You get in a taxi. It cost \$4 to get in and then \$2 per mile. The fare was \$22, how far did you go?

$$4 + 2x = 22$$

Equation

$$2x + 4 = 22$$

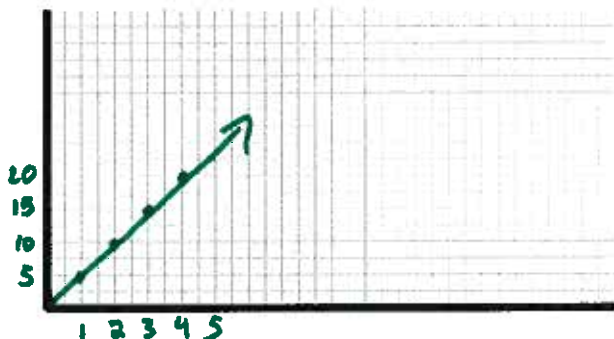
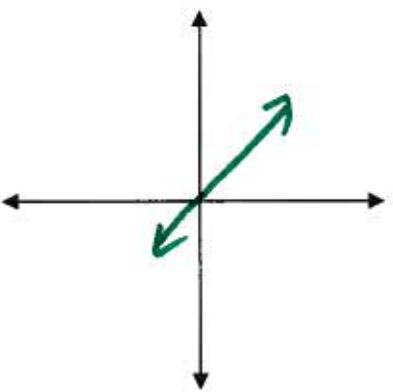
$$\begin{array}{r} -4 \quad -4 \\ \hline 2x = 18 \end{array}$$

$$\frac{2x}{2} = \frac{18}{2}$$

$$x = 9$$

$$9 \text{ miles}$$

Write an expression and graph.

11) Watermelons cost \$5 each.	12) Draw a line that represents direct variation.
<p style="text-align: center;">$5x$</p> 	

13) Identify the constant of variation by circling it.

$y = \frac{3}{4}x$	$y = 13x$	$y = 23.1x$
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First, find the constant of variation, write the direct variation equation, then sketch the graph. Finally, answer the questions.

14) The cost of movie tickets is directly proportional to the number of movie tickets. You and your friends bought 8 tickets for \$68.

$$y = kx$$

$$\frac{68}{8} = \frac{k \cdot 8}{8} \quad k = 8.5$$

$$y = 8.5x$$

How many tickets can you get for \$93.50 SHOW ALL WORK.

$$\frac{93.5}{8.5} = \frac{8.5x}{8.5}$$

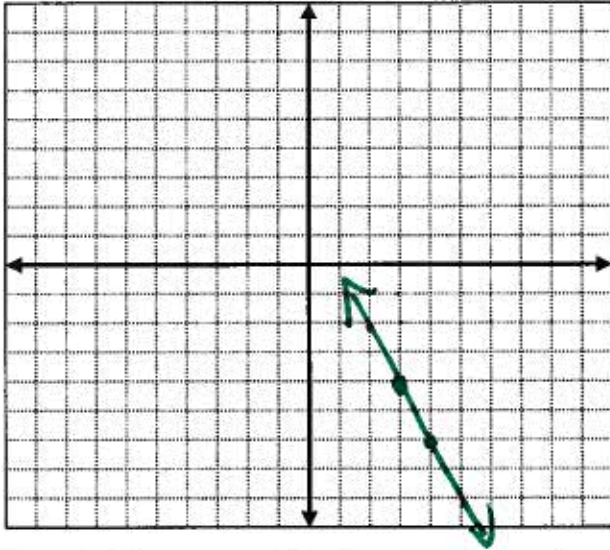
$$x = 11 \text{ tickets}$$

You bought 3 tickets. How much did it cost?

$$y = 8.5(3) = 25.50$$

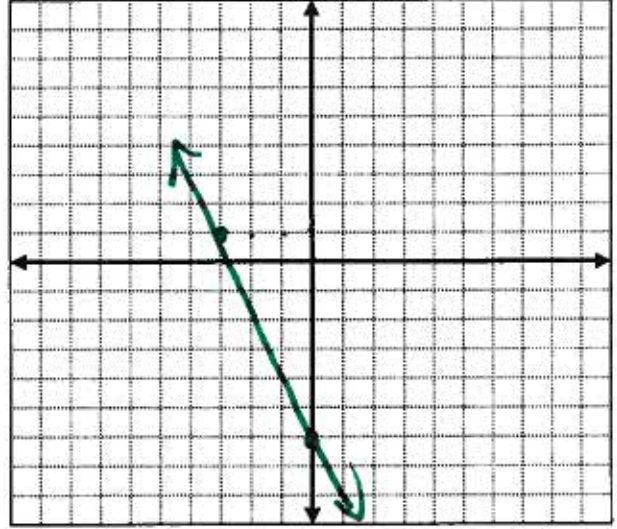
15) Draw the line given the ordered pair and the slope.

$(3, -4) \quad m = -2$



16) Draw the line given the equation.

$$y = -\frac{7}{3}x - 6$$



17) Determine if the ordered pairs are solutions the equation both graphically and algebraically.

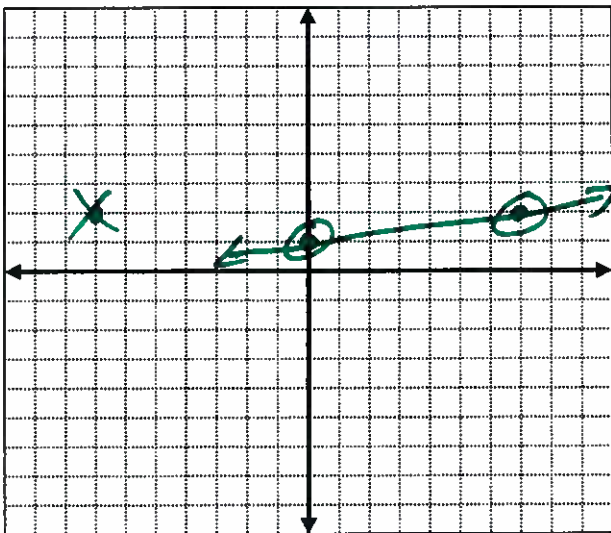
- a) Substitute the ordered pair into the equation.
- b) Draw a line through the ordered pairs that are solutions.
- c) Draw an X through the points that are not.

$$y = \frac{1}{7}x + 1$$

~~(-7, 2)~~

(7, 2)

(0, 1)



$$2 = \frac{1}{7}(-7) + 1$$

$$2 = -1 + 1$$

$$2 = 0$$

X

$$1 = \frac{1}{7}(0) + 1$$

$$1 = 1$$

✓

$$2 = \frac{1}{7}(7) + 1$$

$$2 = 1 + 1$$

$$2 = 2 \checkmark$$

Write an equation for the problem, graph it, and answer the questions.

18) It's 1940, you have \$6 in savings and you spend \$2 a day.

a. Write an equation to represent this.

$$y = -2x + 6$$

b. What is the y-intercept?

$$(0, 6)$$

c. What is the slope? (fraction)

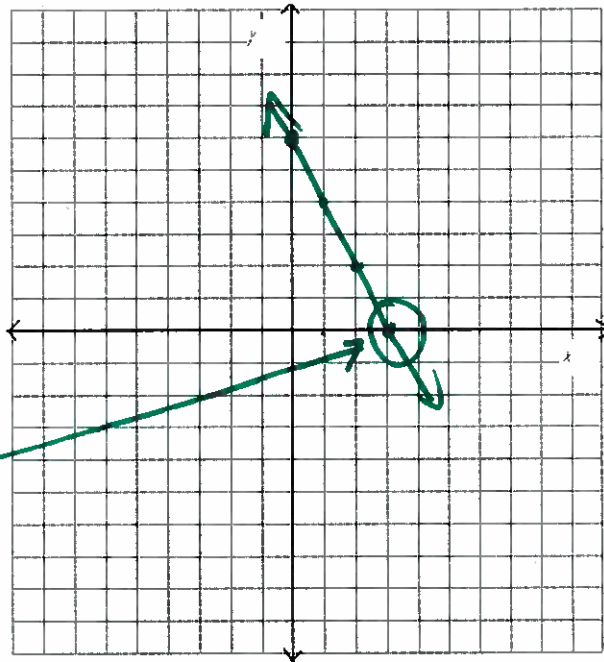
$$\left(-\frac{2}{1}\right)$$

d. When do you run out of money? SHOW ALL WORK.

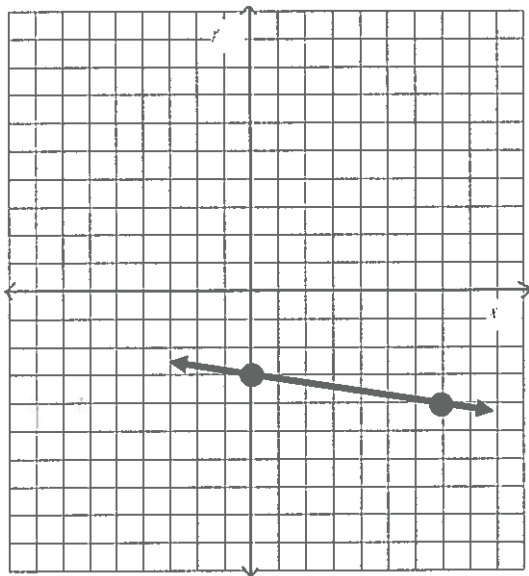
Day 3

$$\begin{array}{r} 0 = -2x + 6 \\ -6 \quad -6 \\ \hline -6 = -2x \end{array} \quad x = 3$$

Equation:



19) Write the equation of the line.



Equation $y = -\frac{1}{7}x - 3$ $b = -3$
 $m = -\frac{1}{7}$

20) Calculate the slope using the formula.

$$\begin{array}{l} x_1 \ y_1 \ x_2 \ y_2 \\ (-17, 44) \ (-60, -11) \end{array}$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-11 - (44)}{-60 - (-17)} = \frac{-55}{-43} =$$

$$\frac{55}{43}$$

21) Write the equation of a line that passes through the point (3, 26) and has a slope of -7.

$$y = mx + b$$

$$26 = -7(3) + b$$

$$26 = -21 + b$$

$$\begin{array}{r} +21 \quad +21 \\ \hline 47 = b \end{array}$$

$$y = -7x + 47$$

22) Write the equation of a line that passes through (11, 33) and (22, 99).

$$x_1 \ y_1 \quad x_2 \ y_2$$

$$\frac{99 - 33}{22 - 11} = \frac{66}{11} = 6$$

$$y = mx + b$$

$$33 = 6(11) + b$$

$$33 = 66 + b$$

$$\begin{array}{r} -66 \quad -66 \\ \hline -33 = b \end{array}$$

$$y = 6x - 33$$

Find the equation of the line and answer the questions.

23) Below are the times and distances for walking. Distance is the y value and time is the x value.

y Distance (km)	x Time (hours)
120	5
144	11

$$(5, 120) \quad (11, 144)$$

$$\frac{144 - 120}{11 - 5} = \frac{24}{6} = 4$$

$$120 = 4 \cdot 5 + b$$

$$120 = 20 + b$$

$$\begin{array}{r} -20 \quad -20 \\ \hline 100 = b \end{array}$$

Where will the hiker be at hour 8?

$$y = 4(8) + 100$$

$$y = 32 + 100$$

$$y = 132 \text{ km}$$

$$y = 4x + 100$$

24) Graph the equations and locate the point of intersection. Substitute to check the solution.

$$y = \frac{2}{3}x - 1 \quad (5, 1) \quad y = -\frac{7}{5}x + 8$$

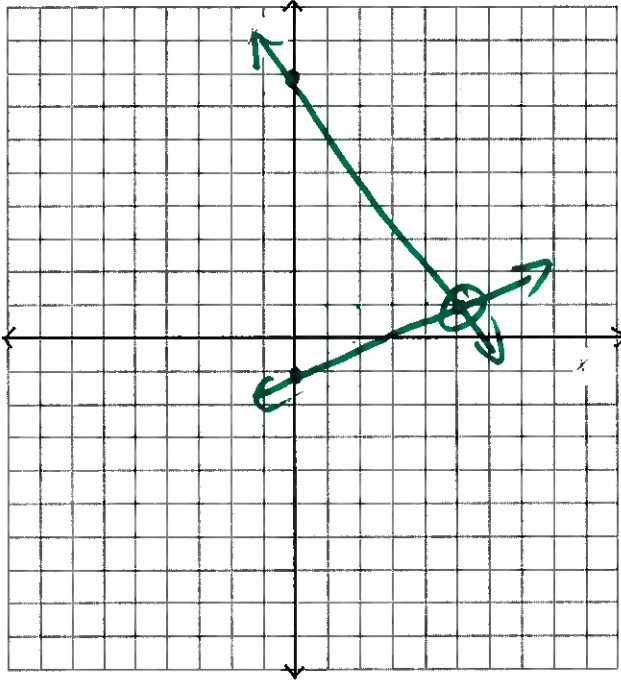
$$1 = \frac{2}{3}(5) - 1 \quad 1 = -\frac{7}{5}(5) + 8$$

$$1 = 2 - 1$$

$$1 = 1 \checkmark$$

$$1 = -7 + 8$$

$$1 = 1 \checkmark$$



25) Use substitution to solve the system of equations.

$$\begin{cases} y = x + 3 \\ 4x + 3y = 26 \end{cases}$$

$$4x + 3(x + 3) = 26$$

$$4x + 3x + 9 = 26$$

$$7x + 9 = 26$$

$$\begin{array}{r} 7x + 9 = 26 \\ -9 \quad -9 \\ \hline 7x = 17 \end{array}$$

$$\frac{7x}{7} = \frac{17}{7}$$

$$x = \frac{17}{7}$$

$$y = \frac{17}{7} + \frac{21}{7}$$

$$y = \frac{38}{7}$$

$$\left(\frac{17}{7}, \frac{38}{7} \right)$$