Algebra 1 – Fall Semester Exam Review

KEY!

1. ∠A and ∠B are complementary. The measure of ∠B is 30° more than the measure of ∠A. What is the measure of each angle?

~~90°~~

$B = 30 + A$
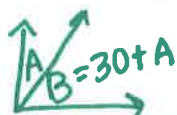
$$\frac{A}{A} + \frac{30+A}{B} = 90$$

$2A + 30 = 90$
$\quad -30 \quad -30$
$2A = 60$

$\dfrac{2A}{2} = \dfrac{60}{2}$
$A = 30$
$B = 30 + 30$

$m\angle A = 30° \quad m\angle B = 60°$

2. ∠T and ∠U are supplementary. The measure of ∠T is 24 more than twice the measure of ∠U. What is the measure of ∠U?

$T = 2U + 24$
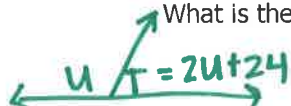
$$\frac{U}{U} + \frac{2U+24}{T} = 180$$

$3U + 24 = 180 \quad U = 52$
$\quad -24 \quad -24$
$\dfrac{3U}{3} = \dfrac{156}{3} \quad T = 2(52) + 24$

$m\angle U = 52°$
$m\angle T = 128°$

3. You are driving to visit a friend in another state who lives 440 miles away. You are driving 55 miles per hour and have already driven 275 miles. **Write and solve** an equation to find how much longer in hours you must drive to reach your destination.

$440 = 275 + 55h$
$-275 \quad -275$

$\dfrac{165}{55} = \dfrac{55h}{55}$

$3 = h$

3 more hours

4. A customer went to a garden shop and brought some potting soil for $17.50 and 4 shrubs. The total bill was $53.50. **Write and solve** an equation to find the price of each shrub.

$17.50 + 4X = 53.50$
$-17.50 \qquad -17.50$

$\dfrac{4X}{4} = \dfrac{36}{4}$

$X = 9$

Each shrub costs $9

5. Kim has determined that when she reads at a rate of 4 pages per minute, the relationship between the number of pages she reads, *p*, and the time she spends reading, *t*, is described by the relationship $p = 4t$. Which best represents the dependent quantity in this situation?

~~A~~ The rate of pages read depends on the number of pages read. } doesn't talk about rate!
~~B~~ The rate of pages read depends on the time spend reading.
(C) The number of pages read depends on the time spent reading.
D The time spent reading depends on the number of pages read.

$p = 4t$

INSIDE: input / independent t (time)

OUTSIDE: output / dependent p (pages)

6. An art supply store is having an inventory sale. All items are marked down by 25%. Michael plans to buy three sets of oil paints and two paint brushes. He calculates the sale price of each item by using the function $f(p) = p - 0.25p$, where *p* represents the original price of the item.

A) What is the independent variable in this relationship and what does it mean in this situation?

p, original price

B) What is the dependent variable in this relationship and what does it mean in this situation?

$f(p)$, sale price.

7. A long distance telephone company charges $4.95 per month and $0.07 per minute for phone calls. What is the independent variable quantity in this situation? *↳ changes*

   ~~A~~ The cost per minute for a long distance call *slope*
   ~~B~~ The total cost for a 10-minute long distance call
   C The total monthly charge for long distance service
   (D) The number of minutes of a long distance call *changes more easily*

8. A baseball team played a total of 162 games last season. The number of games the team lost, *l*, and the number of games the team won, *w*, are represented by the formula below.

   $$l = 162 - w$$
   ↑dependent ↑independent

   Which of the following statement best describes the relationship between the variables *l* and *w*?

   A The number of games lost depends on the total number of games played.
   (B) The number of games lost depends on the number of games won.
   ~~C~~ The total number of games played depends on the number of games won.
   ~~D~~ The number of games won depends on the total number of games played

9. The French Club is holding a car wash fundraiser. They are going to charge $10 per car, and expect between 50 and 75 cars.

   A) What is the independent variable in this relationship? *# of cars washed*
   B) What is the dependent variable in this relationship? *money earned*
   C) What is a reasonable domain for this situation?
   D) What is a reasonable range for this situation?

   Domain
   x's
   (independent) $50 \le x \le 75$

   Range
   y's $500 \le y \le 750$

10. Represent the function $f(x) = \{(5, 9), (6, 6), (7, -2), (-3, -2), (0, 4)\}$ as a graph, table and mapping.

11. Give an example of a set of data that is not a function.
    Repeating x's

12. What is a function?
    A relation with no repeating x's.

13. Which set of ordered pairs represents a function?
    ~~A~~ (3, 10), (5, -4), (7, 10), (-4, 0), (3, 14)
    B (5, 10), (8, 8), (13, 57), (18, 5), (21, 8)
    ~~C~~ (7, -7), (4, -4), (0, 0), (1, 1), (3, 3), (7, 7)
    ~~D~~ (35, -6), (16, -4), (4, -2), (4, 2), (16, 4)

14. If $(x, -3)$ is a solution to the equation $4x - 3y = 21$, what is the value of x?   *(x,y) y = -3*

    $4x - 3(-3) = 21$
    $4x + 9 = 21$
    $ -9 \quad -9$
    $\dfrac{4x}{4} = \dfrac{12}{4}$ $\boxed{x = 3}$

15. In 2004 a married couple could have calculated their estimated income tax, *t*, for that year using the equation $t = 0.25c - 6525$, in which *c* represents their combined taxable income. If a married couple had a combined taxable income between $60,000 and $64,000, which of the following is a reasonable amount for their income tax?
    ~~A~~ $6,525
    B $8,975
    ~~C~~ $13,869
    ~~D~~ $15,500

    in between
    $8,475 & $9,475

    c = 60,000
    .25(60,000) - 6525
    8475

    c = 64,000
    .25(64,000) - 6525
    9475

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16. Tony and Jack are planning a Winter Party. The disc jockey charges a flat fee of $400.00. The caterer charges a $15.00 fee per person. If Tony and Jack want to spend no more than $1,000, what is the maximum number of people who can attend the party?

y-intercept → flat fee of $400.00 · *slope*

$$400 + 15x \le 1{,}000$$
$$-400 \qquad -400$$
$$\frac{15x}{15} < \frac{600}{15}$$
$$x < 40$$

40 people maximum

17. Write the equation that could be used to determine, c, the total cost for n number of people attending the Desmond wants to take guitar lessons. The one-time registration fee is $60, and each lesson cost $40. Write an inequality that can be used to determine x, the number of lessons he can take if he wants to spend no more than c dollars.

$$60 + 40x \le c$$

18. Mr. Adams bought a refrigerator that cost $1200, including tax. The cost of electricity to run this refrigerator is estimated at $78 per year. Which equation best describes c, the total cost of the refrigerator including electricity over n years of operation?

$$c = 1200 + 78n$$

A $c = 1200(78n)$
B $c = 1200(n + 78)$
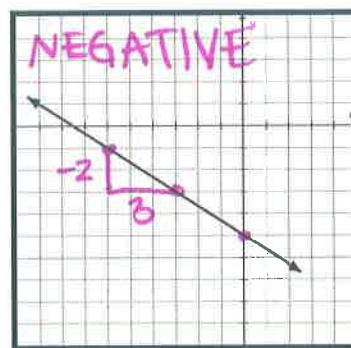C $c = 1200 - 78n$
(D) $c = 1200 + 78n$

19. A waitress at a local restaurant earns $3.25 per hour plus tips. ~~In two weeks~~ she earned a total of $720, including $531.50 in tips. How many hours did the waitress work ~~during this 2-week period~~?

$$3.25h + 531.50 = 720$$
$$\text{(tips)}$$
$$-531.50 \qquad -531.50$$
$$\frac{3.25h}{3.25} = \frac{188.50}{3.25}$$
$$h = 58$$

She worked 58 hours

20. What is the slope of the line shown in the graph?
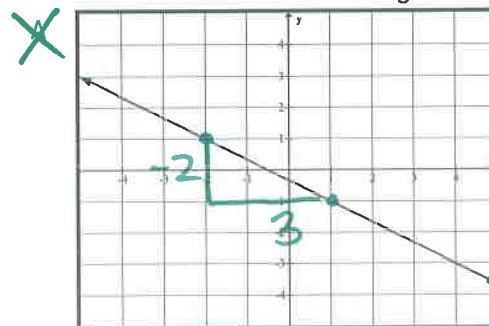
NEGATIVE

PRETTY POINTS

$$\text{Slope} = \frac{\text{RISE}}{\text{RUN}}$$

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

21. Find the slope of the line that passes through the points (5, 7) and (2, -3).

$$m = \frac{\Delta y}{\Delta x}$$

$$\begin{array}{c|c} x & y \\ \hline 5 & 7 \\ 2 & -3 \end{array}$$

$$-3 < \; > -10$$

$$= \frac{-10}{3}$$

22. Which of the following linear functions does (not) represent a rate of change of $-\dfrac{2}{3}$?

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

X (6, -4) and (-12, 8)

$$\begin{array}{c|c} x & y \\ \hline 6 & -4 \\ -12 & 8 \end{array}$$

$$-10 \qquad +12$$

$$m = \frac{12}{-18} = \frac{-2}{3}$$

(C)

x	-3	1	5	9
y	10	4	-2	-8

+4 +4 +4
-6 -6 -6

$$m = \frac{-6}{4} = \frac{-3}{2} \checkmark$$

X $2x + 3y = 12$ Solve for y!
$$-2x \qquad -2x$$

$$\frac{3y}{3} = \frac{-2x}{3} + \frac{12}{3}$$

$$y = \frac{-2}{3}x + 4$$

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23. What is the slope and y-intercept of the equation $2x + 3y = 18$? **solve for y / $y = mx + b$**
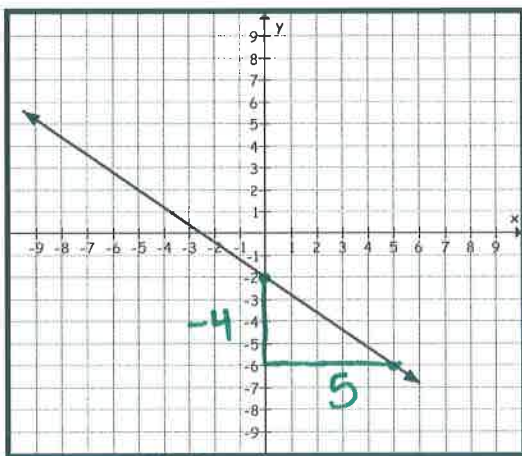
$-2x \qquad -2x$

$$\frac{3y}{3} = \frac{-2x + 18}{3} \quad \frac{}{3}$$

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

$$y = mx + b$$

$m \text{ (slope)} = \frac{-2}{3}$
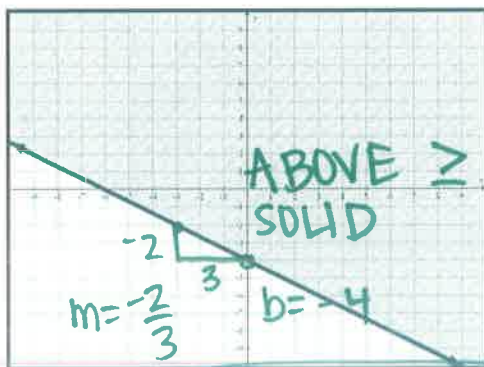
$b \text{ (y-int)} = 6$

24. Given the graph below:

slope

-4

5

Find the rate of change and write the Equation of the line in ~~slope-intercept form~~:

$$m = \frac{-4}{5}$$

$$b = -2$$

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

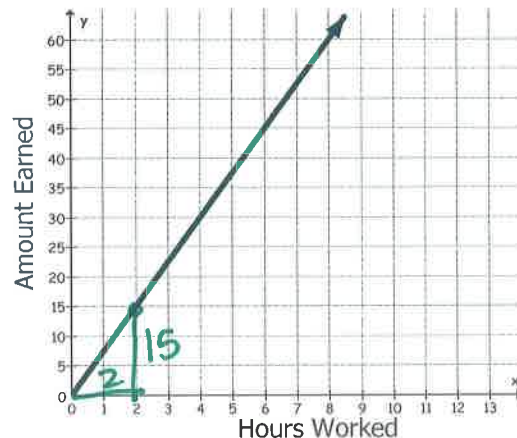25. Write an inequality that represents the graph shown below.

ABOVE $\geq$
SOLID

-2
3

$m = \frac{-2}{3}$ $b = -4$

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

26. Use the table below to determine the following information: Slope, Y-intercept, and Equation of line.

x	y
2	5
4	9
5	11
8	17

$$y = 2x + 1$$

STAT

27. The graph below represents the total amount of money that Janice earns, based on the number of hours she works.
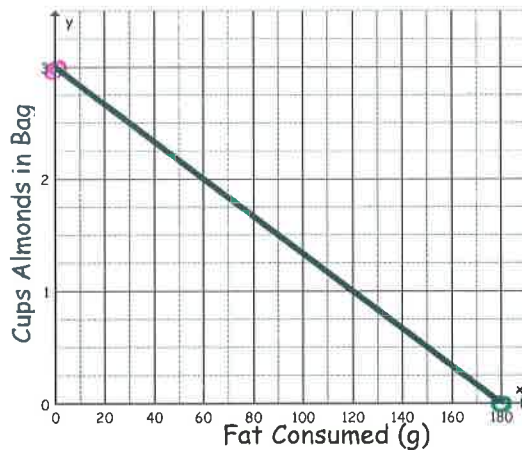
A) At what rate does Janice earn money?

$15 every 2 hours   ($7.50 per hour)

B) What equation would represent this graph?

$$y = 7.5X$$

28. Matt opened a bag of almonds and is eating them for a snack. Each serving is $\frac{1}{4}$ cup and has 15 grams of fat. Look at the graph below.

Cups Almonds in Bag vs. Fat Consumed (g)

A) What does the x-intercept represent? **(180,0)**
   How much fat he consumed after eating all the almonds.

B) What does the y-intercept represent? **(0,3)**
   How many cups of almonds were in the bag at the beginning.

29. Determine if the following relationship is linear. If it is, write a function rule.

x	y
-8	23
-2	5
4	-13
6	-19

$+6 \{$, $+6 \{$, $+2 \{$; -18 , -18 , -6

$m = \frac{-18}{6} = -3$

$m = \frac{-6}{2} = -3$
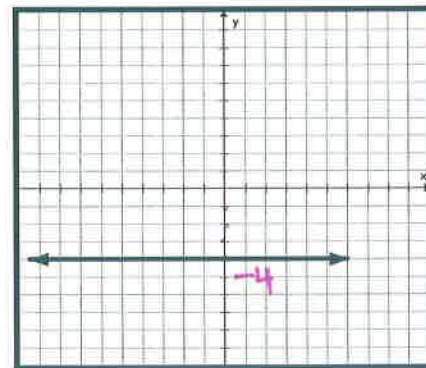
yes

STAT

y = -3x - 1

30. According to the data shown below, which would be the best prediction of the number of passengers at the International Jetport for the year 2008?

Year	Number of Passengers (millions)
1980	30.6
1985	38.5
1990	46.4
1995	54.3
2000	62.2

$+7.9$, $+7.9$, $+7.9$, $+7.9$

2005 70.1
2008 ?
2010 78

- ✗ 70.1 million
- ✗ 68.5 million
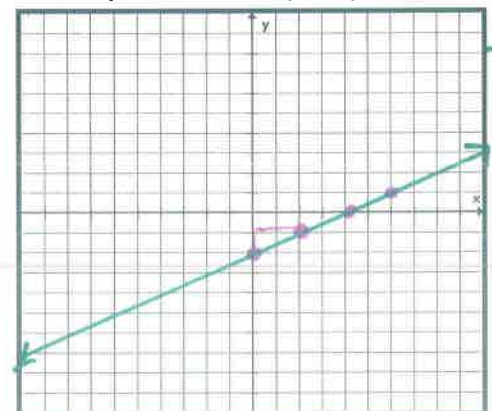- Ⓒ 74.8 million
- ✗ 78.0 million

31. Look at the graph below.

HOY VUX

A) Write the equation: **y = -4**

B) What is the slope? **zero**

32. Graph the equation $2x - 4y = 8$ on the graph below. (Hint: Solve for y first)

$2x - 4y = 8$
$-2x \qquad -2x$

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

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

$m = \frac{1}{2}$ rt 2, up 1

$b = -2$

33. Lori is 4 years older than 3 times the age her son Jon. The difference in Lori's age and Jon's age is 26 years. How old are Lori and Jon?

subtract

$$L = 4 + 3J$$
$$L - J = 26$$

$$(4 + 3J) - J = 26$$
$$4 + 2J = 26$$
$$ -4 \qquad -4$$
$$\frac{2J}{2} = \frac{22}{2}$$

$$J = 11$$
$$L = 4 + 3(11)$$
$$= 37$$

Lori = 37 years
Jon = 11 years

34. A rental car company charges a customer $60 a day plus $0.32 per mile. Write an equation that describes the relationship between the cost, c, of renting the car for 2 days and the number of miles, m, the car was driven?
    A) Equation: $C = 120 + 0.32m$

    B) What is the slope? $.32$

    C) What is the meaning of the slope in this situation? cost per mile.

35. What is the effect on the graph of the equation $6x + 3y = 12$ if 12 is changed to 36?

    A. The line is translated up 24 units.
    B. The line is translated up 8 units.
    C. The line is translated down 24 units.
    D. The line is translated down 8 units.

$$6x + 3y = 36$$

Line1
$$6x + 3y = 12$$
$$-6x \qquad -6x$$
$$\frac{3y}{3} = \frac{-6x}{3} + \frac{12}{3}$$
$$y_1 = -2x + 4$$

Line2
$$6x + 3y = 36$$
$$-6x \qquad -6x$$
$$\frac{3y}{3} = \frac{-6x}{3} + \frac{36}{3}$$
$$y_2 = -2x + 12$$

graph & compare.

36. Which equation represents the line that passes through the point (6,-2) and has a slope of $\frac{2}{3}$?

$x_1 \, y_1$

A. $y + 2 = \frac{2}{3}x - 4$

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

C. $y - 2 = \frac{2}{3}x - 4$

D. $y + 2 = \frac{2}{3}x + 4$

point-slope
$$y - y_1 = m(x - x_1)$$
$$y - (-2) = \frac{2}{3}(x - 6)$$
$$y + 2 = \frac{2}{3}(x - 6)$$
$$y + 2 = \frac{2}{3}x - 4$$