

Dublin Algebra 1 Semester 1 Exam Review Packet 2015

MODULE 1

1. Solve $-8 = \frac{x}{2}$ for x .

$$\boxed{-16 = x}$$

2. Tonya is saving money to buy a computer that costs \$375. She has \$75 saved, and each week she adds \$25 to her savings. How many weeks will it take her to save enough money to buy the computer?

$$75 + 25x = 375$$

$$25x = 300$$

$$\boxed{x = 12 \text{ weeks}}$$

3. What is the solution for the equation

$$-3.2 = 2.5 + 1.2m?$$

$$-2.5 - 2.5$$

$$-5.7 = 1.2m$$

$$\boxed{m = -4.75}$$

4. Solve $2.5 = \frac{x}{6}$.

$$\boxed{15 = x}$$

5. Solve the equation $-4 = \frac{12p + 10}{2}$.

$$-8 = 12p + 10$$

$$\frac{-18}{12} = \frac{12p}{12}$$

$$\boxed{p = -\frac{3}{2}}$$

6. Dante's cell phone company charges \$45 per month for unlimited calls and internet use and \$0.25 per text message. His last cell phone bill was \$60.50. How many text messages did Dante send last month?

$$45 + .25x = 60.50$$

$$.25x = 15.50$$

$$x = 62 \text{ texts}$$

Solve each of the following:

7. $\frac{24}{5z+4} = \frac{4}{z-1}$

$$24(z-1) = 4(5z+4)$$

$$24z - 24 = 20z + 16$$

$$24z = 20z + 40$$

$$4z = 40$$

$$\boxed{z = 10}$$

8. $\frac{1}{8}(5y+64) = \frac{1}{4}(20+2y)$

$$\frac{5}{8}y + 8 = 5 + \frac{1}{2}y$$

$$5y + 64 = 40 + 4y$$

$$5y = -24 + 4y$$

$$\boxed{y = -24}$$

9. $14 - \frac{1}{5}(x-10) = \frac{2}{5}(25+x)$

$$14 - \frac{1}{5}x + 2 = \frac{50}{5} + \frac{2}{5}x$$

$$16 - \frac{1}{5}x = 10 + \frac{2}{5}x$$

$$16 = 10 + \frac{3}{5}x$$

$$\frac{5}{3} \cdot 6 = \frac{3}{5}x \cdot \frac{5}{3}$$

$$\boxed{10 = x}$$

10. $-2(3x-3) = 6(5-2x)$

$$-6x + 6 = 30 - 12x$$

$$-6x = 24 - 12x$$

$$6x = 24$$

$$\boxed{x = 4}$$

11. $3x - 4 = 2x + 8 - 5x$

$$3x - 4 = -3x + 8$$

$$3x = -3x + 12$$

$$6x = 12$$

$$\boxed{x = 2}$$

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MODULE 2

1a. How many coefficients are in the expression

$$\frac{1}{3}y^2 - 18y + 9 - 2y^{-2} \quad 3$$

b. List the coefficients: $\frac{1}{3}, -18, -2$

2. Is each of the following a term of the expression $-9x^3 + 12p + 6$?

- | | | |
|------------|--------------------------------------|-------------------------------------|
| A) p | <input type="radio"/> Yes | <input checked="" type="radio"/> No |
| B) $-9x^3$ | <input checked="" type="radio"/> Yes | <input type="radio"/> No |
| C) 3 | <input type="radio"/> Yes | <input checked="" type="radio"/> No |
| D) 6 | <input checked="" type="radio"/> Yes | <input type="radio"/> No |

3. Kurt works at a cafe and earns \$16 per hour. On Wednesday, he worked t hours at the cafe, and his neighbor paid him \$5 per hour to babysit for b hours. Which expression best represents the amount Kurt earned on Wednesday?

- | | |
|---------------|--|
| A) $16t + 5$ | <input checked="" type="radio"/> C) $16t + 5b$ |
| B) $16t - 5b$ | D) $16b + 5t$ |

4. Is each of the following equivalent to $6(2y - 4) + p$? $12y - 24 + p$

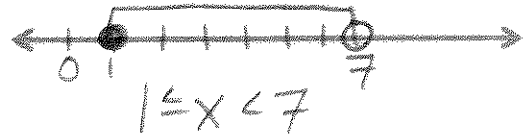
- | | | |
|--------------------|--------------------------------------|-------------------------------------|
| A) $p + 12y - 24$ | <input checked="" type="radio"/> Yes | <input type="radio"/> No |
| B) $6y + p - 24$ | <input type="radio"/> Yes | <input checked="" type="radio"/> No |
| C) $p - 6(4 - 2y)$ | <input checked="" type="radio"/> Yes | <input type="radio"/> No |
| D) $24 + 12y + p$ | <input type="radio"/> Yes | <input checked="" type="radio"/> No |

5. Les bought 6 pairs of shorts for s dollars each and a blazer that cost three times as much as a pair of shorts. He spent a total of \$139.50. How much did the blazer cost?

$$\begin{aligned} \text{shorts} &= s & 6s + 3s &= 139.50 \\ \text{blazer} &= 3s & 9s &= 139.50 \\ & & s &= 15.5 \\ \text{Blazer} &= 3(15.5) & &= \$46.50 \end{aligned}$$

6. Solve and graph the solutions to the compound inequality:

$$\begin{aligned} -6 &\leq 3x - 9 < 12 \\ -6 + 9 &\leq 3x - 9 + 9 < 12 + 9 \\ 3 &\leq 3x < 21 \\ 1 &\leq x < 7 \end{aligned}$$



7. The equation for finding the area of a trapezoid is

$$A = \frac{1}{2}(b_1 + b_2)h. \text{ What is the equation solved for } h?$$

A) $h = \frac{A}{b_1 + b_2}$

B) $h = \frac{2A}{b_1 + b_2}$

C) $h = \frac{1}{2}(b_1 + b_2)$

D) $h = 2A - b_1 - b_2$

$$\begin{aligned} 2A &= (b_1 + b_2)h \\ \frac{2A}{b_1 + b_2} &= h \end{aligned}$$

8. Marcus is buying 10 gift bags for his birthday party. He will choose items to put in the bags and then pay an additional charge of \$0.75 for the actual bag. Marcus cannot spend more than \$50. Write and solve an inequality to find the most Marcus can spend on the items for each bag.

Let x = cost of 1 item

$$10(x + .75) \leq 50$$

$$x + .75 \leq 5$$

$$x \leq 4.25$$

9. Write the coefficient(s) in the expression

$$7x^2 - y + 9.$$

$$7, -1$$

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10. Suppose x and y are the number of students in two classrooms, where $x < y$. Compare the expressions using $<$, $=$, or $>$.

$(2x)^2 < (x+y)^2$ Since $x < y$,
 $2x < x+y$

11. On Monday, Nita earned \$85 for h hours of babysitting. On Wednesday, she earned the same rate for 8 hours of babysitting and got a \$12 tip. Write an expression to represent how much Nita earned on Wednesday.

pay rate = $\frac{\$85}{h \text{ hours}}$ Wednesday:
 $8\left(\frac{85}{h}\right) + 12$

12. A cell phone company charges \$45 per month for unlimited calls and \$0.25 per text message. Another cell phone company charges \$0.15 per text message and \$70 per month for unlimited calls.

- a. Write an equation to represent the number of text messages sent in a month that would make each plan cost the same amount.

$45 + .25x = 70 + .15x$

- b. Solve the equation and interpret the solution.

At 250 text messages, the cost will be the same.

$.25x = 25 + .15x$
 $.10x = 25$
 $x = 250$

13. Solve the inequality $8 - d \geq -3d + 4$.

$8 \geq -2d + 4$
 $4 \geq -2d$
 $\frac{4}{-2} \geq \frac{-2d}{-2}$ flip!
 $-2 \geq d \rightarrow d \leq -2$

14. Solve the inequality $2(3x - 4) \geq 9x - 10$.

$6x - 8 \geq 9x - 10$
 $6x \geq 9x - 2$
 $-3x \geq -2$ flip!
 $\frac{-3x}{-3} \leq \frac{-2}{-3}$
 $x \leq \frac{2}{3}$

15. Juan is making birdhouses to sell at a craft show. The cost of making the birdhouses is \$80 plus \$6.25 per birdhouse. He will sell them for \$16 each. Write and solve an inequality to find the number of birdhouses he must sell to make a profit. Let $x = \#$ birdhouses

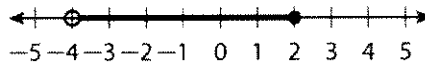
$80 + 6.25x < 16x$

$80 \leq 9.75x$

$8.2 \leq x$

At least 9 birdhouses

16. Write the solution of the compound inequality graphed below.



$-4 < x \leq 2$

17. Solve $\frac{f-7}{g} = h$ for f

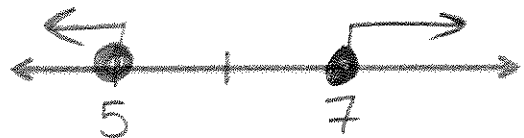
$f - 7 = g \cdot h$
 $f = g \cdot h + 7$

18. Solve and graph the solutions to the compound inequality:

$6b - 1 \geq 41$ or $2b + 1 \leq 11$

$6b \geq 42$ $2b \leq 10$

$b \geq 7$ or $b \leq 5$



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MODULE 3

1. A restaurant sells tea for \$1.50 per cup.
A group of 6 people orders drinks.
- Write a function for the cost of tea depending on the number of cups ordered.

$f(x) = 1.50x$

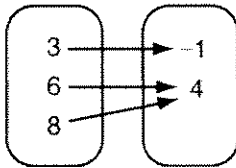
- Find a reasonable domain for the situation.

$\{0, 1, 2, 3, 4, 5, 6\}$

- Find a reasonable range for the situation.

$\{0, 1.50, 3, 4.50, 6, 7.50, 9\}$

2. Given the relation represented by the mapping:



- Is the relation a function? *yes*

- Give the domain of the relation: $\{3, 6, 8\}$

- Give the range of the relation: $\{-1, 4\}$

3. Kim burns 85 calories per hour hiking. How many calories will Kim burn in h hours? Identify the independent and dependent variables of this situation.

Calories burnt = $85h$
 indep = # of hours
 dep = calories burnt

4. Is each of the following a function?

- A (2, 1), (4, 3), (6, 5), (8, 7)

Yes No

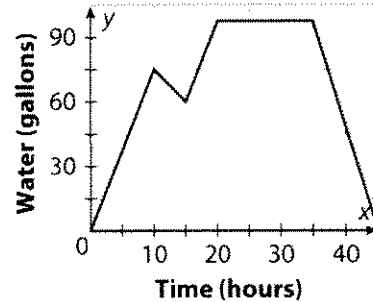
- B (2, 1), (4, 3), (6, 5), (2, 7)

Yes No

- C (2, 1), (4, 1), (6, 5), (8, 7)

Yes No

5. The amount of water in Nir's rain barrel is represented on the graph. Is each of the following a possible interpretation of the graph?



- The barrel started off empty.
 Yes No
- Nir used water from the barrel to water her plants after 35 hours.
 Yes No
- It rained for the first 10 hours.
 Yes No

6. The table below shows the relationship between the size of a painting by a particular artist and the price the gallery charges for the painting.

Painting size, in ² (x)	6	8	10
Price, dollars (y)	30	40	50

Handwritten annotations: +2 above 8 and 10; +10 below 30 and 40.

Write a function that describes the relationship and use it to find the price of a 16 in² painting.

$m = \frac{10}{2} = 5$ $f(x) = 5x$
 (y-int is 0) $f(16) = 5(16)$
 $f(16) = \$80$

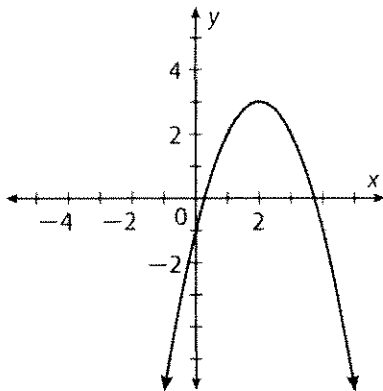
7. If $f(x) = -2x+7$, then what is the values of $f(-6)$?

$f(-6) = -2(-6) + 7$
 $= 12 + 7$
 $= 19$

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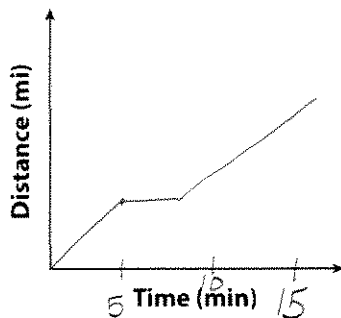
8. The graph of $f(x) = -x^2 + 4x - 1$ is below.



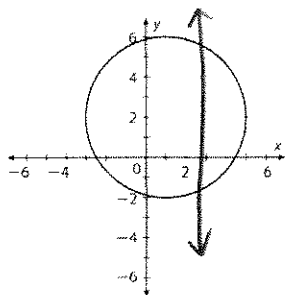
Find the value of $f(x)$ when $x = 0$.

$$f(0) = -1$$

9. Varun drove to work this morning. It took him 15 minutes. He stopped at a traffic light for 3 minutes after driving for 5 minutes. Sketch a graph to represent the distance from Varun's house during his drive to work.



10. Is the relation represented on the graph below a function? Explain your answer.



No, the x -value drawn has two y -values

MODULE 4

1. What is the fifth term of the sequence defined by $f(n) = 3(n-3)$?

$$\begin{aligned} f(5) &= 3(5-3) \\ &= 3(2) \\ &= 6 \end{aligned}$$

2. The first term of a sequence with the rule $f(n) = 2f(n-1) + 2$ is 4. Choose True or False.

- A) The second term is 6. $f(1) = 4$
 True False $f(n) = 2 \cdot \text{prev. term} + 2$
- B) The third term is 22. $f(1) = 4$
 True False $f(2) = 2 \cdot 4 + 2 = 10$
- C) The fourth term is 46. $f(3) = 2 \cdot 10 + 2 = 22$
 True False $f(4) = 2 \cdot 22 + 2 = 46$

3. Which explicit function defines the sequence

$-8, -6, -4, \dots$?
 $+2 \quad +2$

- A) $f(n) = -10 - n$ B) $f(n) = -10 + n^2$
~~C) $f(n) = n - 9$~~ **D) $f(n) = 2n - 10$**

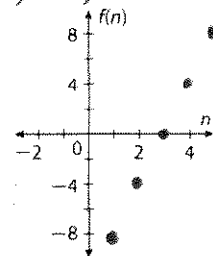
4. Is each of the following an arithmetic sequence?

- A) $\frac{1}{3}, 1, 1\frac{2}{3}, 2\frac{1}{3}, \dots$ $d = \frac{2}{3}$ Yes No
- ~~B) $-12, -4, 0, 2, \dots$~~ Yes No
- C) $-6, 0, 6, 12, \dots$ Yes No
- ~~D) $-20, 15, -10, 5, \dots$~~ Yes No

5. a. A sequence is defined by the rule $f(n) = f(n-1) + 4$. The first term is -8 . Write the first five terms of the sequence.

$-8, -4, 0, 4, 8$

b. Graph the sequence.



6. Write a recursive rule for the sequence 10, 18, 26, 34, ...

$$f(n) = f(n-1) + 8, f(1) = 10$$

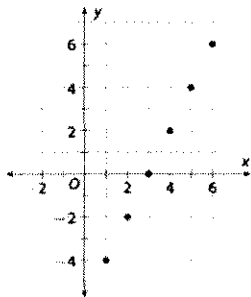
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7. Write a recursive and explicit rule for the sequence 1, -2, -5, -8....

Rec: $f(n) = f(n-1) - 3, f(1) = 1$

Exp: $f(n) = -3n + 4$

8. Leia sells homemade fruit bars. The profit she makes in dollars, y , from the number of bars she sells, x , is represented on the graph.



a. Find the common difference of the sequence. $d = 2$

b. Write a recursive rule for the sequence.

$f(n) = f(n-1) + 2; f(1) = -4$

c. Write an explicit rule for the sequence.

$f(n) = 2n - 6$

d. In July, Leia sold 32 fruit bars. What was her profit in July?

$f(32) = 2(32) - 6$
 $= 64 - 6$
 $= 58$

MODULE 5

1. Is each of the functions a linear function?

- A) $y = 4x - 7$ Yes No
- B) $y = 6x^2 - 1$ Yes No
- C) $y = \frac{1}{2x} + 10$ Yes No
- D) $y = -7$ Yes No

2. Does each of the following equations describe a line with an x-intercept of 7?

- A) $-2x - 7y = -14$ Yes No
- B) $3x + 2y = 14$ Yes No
- C) $-4x + 2y = -28$ Yes No
- D) $x = 7$ Yes No

Use the information below for 3-4.

Stanley is running a 5-mile race. He runs 1 mile every 7 minutes. Stanley's distance from the finish line after x minutes is represented by the function $x + 7y = 35$.

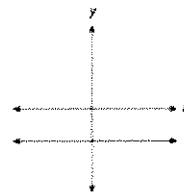
3. Find and interpret the x-intercept.

$x + 7(0) = 35$
 $x = 35$ $(35, 0)$
 After 35 minutes, Stanley is at the finish line.

4. Find and interpret the y-intercept.

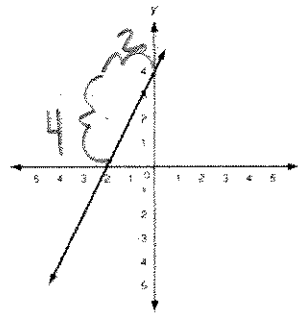
$0 + 7y = 35$ $(0, 5)$ At 0 minutes, he is 5 miles from the finish line.
 $7y = 35$
 $y = 5$

5. What describes the slope of the line shown on the graph below?



- A) positive A
- B) negative B
- C) 0 C
- D) undefined D

6. What is the slope of the line below?

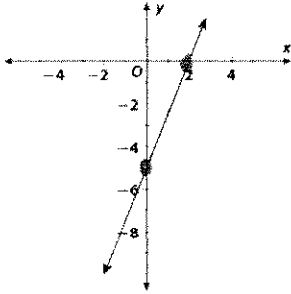


$m = \frac{4}{2}$

$m = 2$

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7.



a. What are the x- and y-intercepts of the line graphed above?

x-int: (2, 0) y-int: (0, -5)

b. What is the slope of the line?

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

c. Write an equation for the line in standard form.

$2 \cdot y = (\frac{5}{2}x - 5) \cdot 2$
 $2y = 5x - 10$
 $10 = 5x - 2y$
 $5x - 2y = 10$

8. Does #6 or #7 have the greatest rate of change? Explain how you know.

#7 has a greater rate because $\frac{5}{2} > 2$.

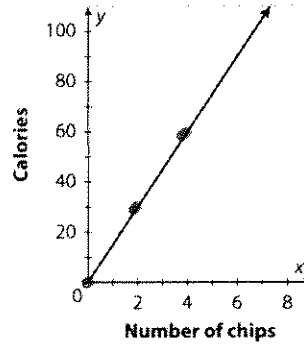
9. Do the lines for each of the following equations have a positive slope?

- A) $2x + 2y = 2$ $\frac{2y}{2} = \frac{-2x+2}{2}$ Yes No
- B) $y = -\frac{2}{3}x$ Yes No
- C) $-x + 2y + 4 = 0$ Yes No
- D) $9.5x + 0.6y = 0$ Yes No

10. Find the slope of $-8x + 5y = 0$.

$\frac{5y}{5} = \frac{8x}{5}$
 $y = \frac{8}{5}x$
 $m = \frac{8}{5}$

11. The graph below shows the relationship between the number of tortilla chips and total number of calories of the chips.



$m = \frac{30 \text{ cal.}}{2 \text{ chips}}$
 $m = 15$

a. Find and interpret the slope.

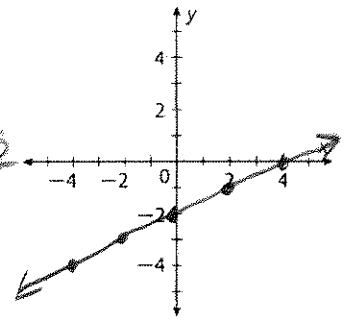
$m = 15$. There are 15 calories per 1 chip

b. Write an equation to represent the relationship.

$y = 15x$
 (y-int is 0)

12. Graph $x - 2y = 4$.

$\frac{-2y}{-2} = \frac{-x+4}{-2}$
 $y = \frac{1}{2}x - 2$



13. A line has an x-intercept of 2 and a y-intercept of 6. Find the slope of the line.

$(2, 0) (0, 6)$ $m = \frac{6-0}{0-2}$
 $m = \frac{6}{-2} = -3$

MODULE 6

1. Write an equation in point-slope form for a line that includes the origin and (9, -3).

$(0, 0) (9, -3)$ $y + 3 = -\frac{1}{3}(x - 9)$
 $m = \frac{-3-0}{9-0}$
 $m = \frac{-3}{9} = -\frac{1}{3}$ $y - 0 = -\frac{1}{3}(x - 0)$

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2. Line m includes the points $(-5, 3)$ and $(-2, -6)$. Line n has the same slope as line m and a y -intercept of $-\frac{2}{3}$. Write the equation for line n in slope-intercept form.

$$m = \frac{-6-3}{-2+5} = \frac{-9}{3} = -3$$

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

Use this information for 3 and 4.

A landscape service charges customers a one-time fee and an hourly rate of \$15. For 3 hours of work, it charges \$75.

3. Write an equation in point-slope form.

$$y - 75 = 15(x - 3)$$

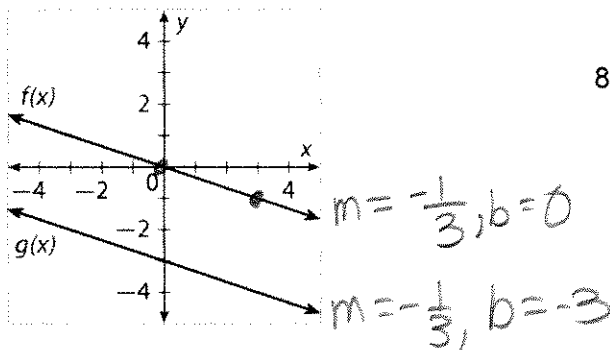
4. How much does the landscape service charge for 10 hours of work?

$$y - 75 = 15(10 - 3)$$

$$y - 75 = 105$$

$$y = \$180$$

5. The graphs of $f(x)$ and $g(x)$ are shown below.



a. Write equations in slope-intercept form for $f(x)$ and $g(x)$.

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

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

b. Are the x terms or the constant terms equal in the equations of $f(x)$ and $g(x)$?

x terms

6. Write an equation in standard form for a line that passes through $(2, 2)$ and $(0, -3)$.

$$m = \frac{-3-2}{0-2} = \frac{-5}{-2} = \frac{5}{2}$$

$$y + 3 = \frac{5}{2}(x - 0)$$

$$y + 3 = \frac{5}{2}x$$

$$2 \cdot 3 = \left(\frac{5}{2}x - y\right) \cdot 2$$

$$6 = 5x - 2y$$

$$\boxed{5x - 2y = 6}$$

7. For $f(x) = 3x + 5$ and $g(x) = \frac{3}{4}x + 5$, determine if each statement is True or False.

- A $f(x)$ and $g(x)$ have the same y -intercept. True False
- B $f(x)$ and $g(x)$ have the same slope. True False
- C The graph of $f(x)$ is steeper than the graph of $g(x)$. True False
- D The graph of $g(x)$ is steeper than the graph of $y = x$. True False

Use this information for 8 and 9.

Mr. Suarez drives at a speed of 60 miles per hour to visit his brother who lives 200 miles away from his home.

8. Write an equation in slope-intercept form that represents the distance d in miles from his brother's home and t is the time in hours he has been driving.

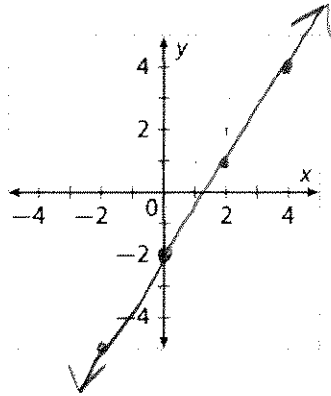
$$d = -60t + 200$$

9. Mr. Suarez's brother moved 40 miles closer to Mr. Suarez's house. Write an equation that represents this new situation.

$$d = -60t + 160$$

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



11. Find the x- and y-intercepts of $5x - 3y = 12$.

x-intercept: $5x = 12$
 $x = \frac{12}{5}$
 $(\frac{12}{5}, 0)$

y-intercept: $-3y = 12$
 $y = -4$
 $(0, -4)$

12. Give an example of a linear equation with an undefined slope.

$x = 2$

13. A computer programmer charges \$45 an hour for coding projects plus a start-up fee of \$150.

a. Write an equation to represent the total cost, t , of a project that takes h hours.

$t = 45h + 150$

b. How much does the programmer charge for a coding project that takes 25 hours?

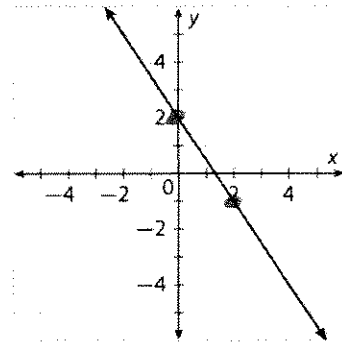
$t = 45(25) + 150 = \$1,275$

Module 7

1. Write an equation in slope-intercept form to represent a line that passes through the points $(-4, 1)$ and $(-2, 4)$.

$m = \frac{4-1}{-2+4}$
 $m = \frac{3}{2}$
 $y - 1 = \frac{3}{2}(x + 4)$
 $y - 1 = \frac{3}{2}x + 6$
 $y = \frac{3}{2}x + 7$

2. Line r is shown on the graph.

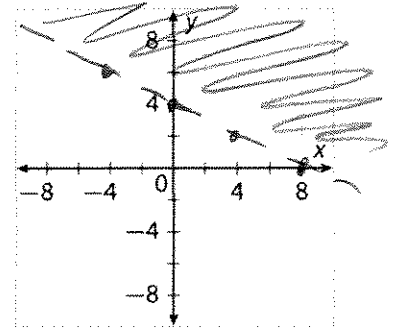


What is the equation of line r ?

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

3. Graph the inequality $y > -\frac{1}{2}x + 4$.

$y > -\frac{1}{2}x + 4$



4. Is $(10, -7)$ a solution of $y \geq -0.5x - 5$? Explain your answer.

$-7 \geq -0.5(10) - 5$?
 $-7 \geq -5 - 5$?
 $-7 \geq -10$?

Yes, $(10, -7)$ is a solution

5. Is each ordered pair a solution of $y \geq 5x - 2$?

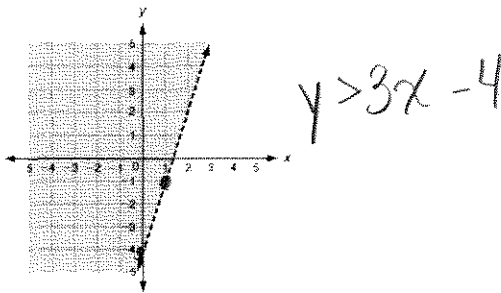
- A) (1, 5) Yes No
- B) (3, 13) Yes No
- C) (2, 9) Yes No

$5 \geq 5(1) - 2$ $13 \geq 5(3) - 2$ $9 \geq 5(2) - 2$
 $5 \geq 3$ $13 \geq 13$ $9 \geq 8$
 yes yes

Name _____

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6. The solution of which linear inequality is graphed below?

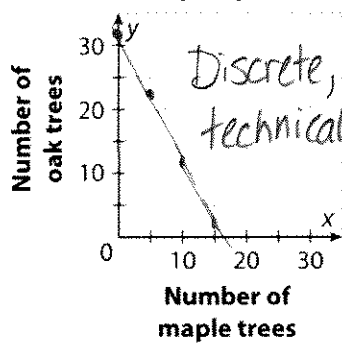


- A) $3x - y > -4$ B) $-3x + y > 4$
 C) $3x - y < 4$ D) $3x + y < 4$

7. The Parks Department is planting trees. Maple trees cost \$50 and oak trees cost \$25. The tree-planting budget is \$800. Write a linear equation to represent the tree-planting budget.

let $x = \# \text{ maples}$
 $y = \# \text{ oaks}$
 $50x + 25y = 800$

8. Graph the equation from Problem 7. If the Parks Department buys 15 maple trees, how many oak trees can they buy?

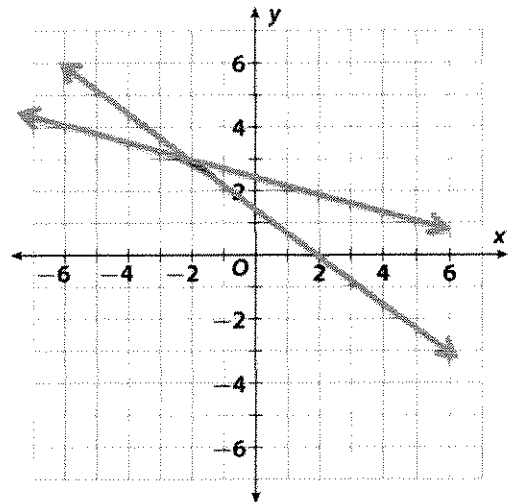


$m = -2 = \frac{-10}{5}$

$25y = -50x + 800$
 $y = -2x + 32$
 $y = -2(15) + 32$
 $y = -30 + 32$
 $y = 2 \text{ oak trees}$

MODULE 11

1. What ordered pair is the solution for the system graphed below?



$(-2, 3)$

2. A linear system has no solution. Choose True or False for each statement about the graph of the system.

- A The slopes of the lines are the same.
 True False
 B The lines are parallel.
 True False
 C The y-intercepts of the lines are the same.
 True False
 D The x-intercepts of the lines are the same.
 True False

3. Solve $\begin{cases} 3x + 5y = 27.5 & (2) \\ 2x + 3y = 16 & (3) \end{cases}$

$-6x - 10y = -55$
 $+ 6x + 9y = 48$

$-1y = -7$

$y = 7$

$(-\frac{5}{2}, 7)$

$2x + 3(7) = 16$

$2x + 21 = 16$

$2x = -5$

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

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4. A system of two equations includes the equation $y = -\frac{2}{5}x - \frac{1}{2}$. If the system has infinitely many

solutions, can each of the following be the second equation of the system?

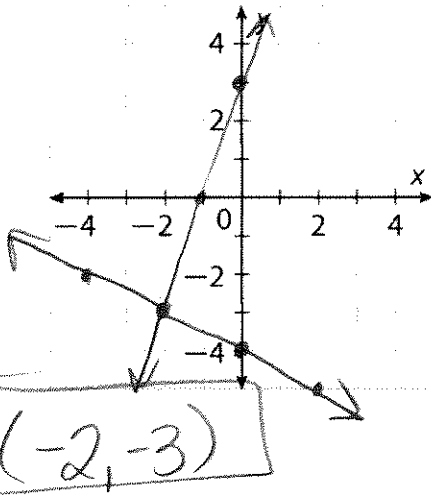
- A) $4x + 10y = -5$ Yes No
- B) $y = -\frac{2}{5}x + 8$ Yes No
- C) $2x + y = -1$ $y = -2x - 1$ Yes No
- D) $y + 1 = -\frac{2}{5}(x - \frac{5}{4})$ Yes No

$y = -\frac{2}{5}x - \frac{1}{2}$

$y + 1 = -\frac{2}{5}(x - \frac{5}{4})$

$y + 1 = -\frac{2}{5}x + \frac{1}{2}$
 $y = -\frac{2}{5}x - \frac{1}{2}$

5. Solve by graphing: $\begin{cases} y - 3x = 3 \\ y = -\frac{1}{2}x - 4 \end{cases}$ $y = 3x + 3$



6. Find the x coordinate of the solution for:

$\begin{cases} x - 2y = -7 \\ 4x + 2y = 22 \end{cases}$

$5x = 15$

$x = 3$

7. Find the y coordinate of the solution for:

$\begin{cases} -2(7x + 5y) = 40 & (2) \\ 7(2x + 4y) = -4 & (7) \end{cases}$

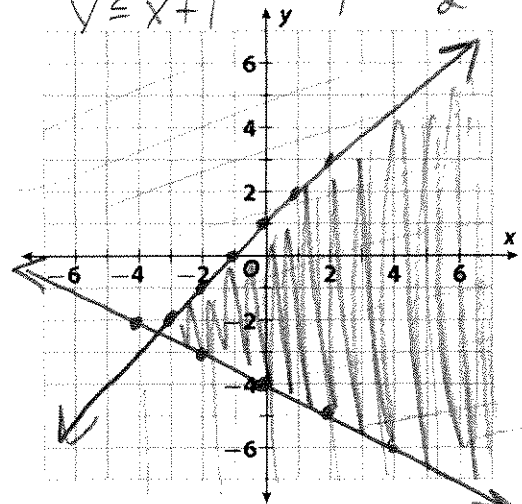
$\begin{array}{r} -14x - 10y = -80 \\ + 14x + 28y = -28 \\ \hline 18y = -108 \end{array}$

$y = -6$

MODULE 12

1. a. Graph $\begin{cases} -x - 2y \leq 8 \\ y - 1 \leq x \\ y \leq x + 1 \end{cases}$

$-x - 2y \leq 8$
 $-2y \leq x + 8$
 $y \geq -\frac{1}{2}x - 4$



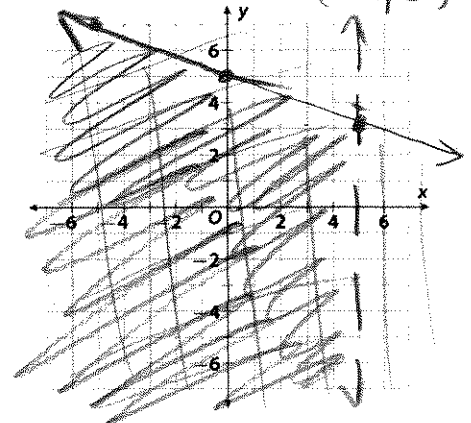
b. Give two ordered pairs that are solutions and two ordered pairs that are not solutions to the system.

Solns: $(0, 0)$
 $(1, 0)$

Not Solns: $(-2, 2)$
 $(-4, 0)$

2. Graph $\begin{cases} x + 2 < 7 \\ -2x - 3y \geq -15 \end{cases}$

$x < 5$
 $-3y \geq 2x - 15$
 $y \leq -\frac{2}{3}x + 5$



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3. Dougie's Doggies and Totally Dogs are two daycare centers for dogs. Both centers charge a flat fee plus an hourly fee for dogs to stay and play. The function $D(x)$ represents the total cost of a dog staying at Dougie's Doggies for x hours. The function $T(x)$ represents the total cost of a dog staying at Totally Dogs for x hours.

0	x	2	4	6	8	10
25	$D(x)$	31	37	43	49	55
30	$T(x)$	34	38	42	46	50

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

$m = \frac{4}{2} = 2$

a. Write a system of linear functions to represent this situation.

$D(x) = 3x + 25$

$T(x) = 2x + 30$

b. For how many hours of play do the dog daycares charge the same amount?

$3x + 25 = 2x + 30$

$x = 5$

5 hours

4. An office manager spent \$4870 on a total of 14 chairs and desks. Each chair costs \$125, and each desk costs \$515. How many chairs and how many desks did he buy?

Let $c = \#$ of chairs
 $d = \#$ of desks

$c + d = 14$

$125c + 515d = 4870$

$-125c - 125d = -1750$

$390d = 3120$

$d = 8$

$c = 6$

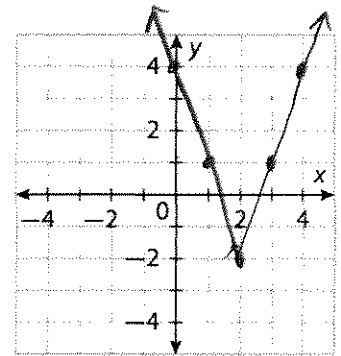
6 chairs
 8 desks

MODULE 13

1. Graph

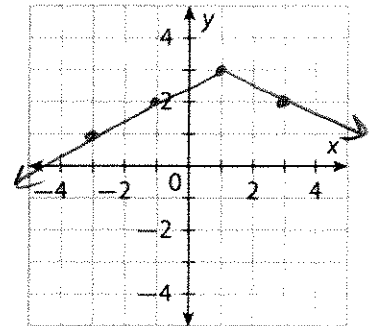
$f(x) = \begin{cases} -3x + 4 & \text{if } x < 2 \\ 3x - 8 & \text{if } x \geq 2 \end{cases}$

$3(2) - 8$
 $6 - 8 = -2$

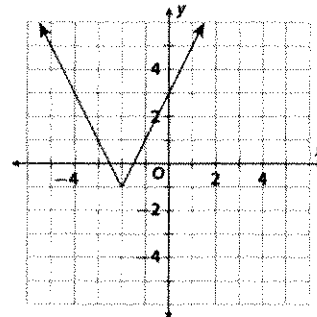


2. Graph

$y = -\frac{1}{2}|x - 1| + 3$



Use the graph below for 3-6.



3. Write a function to match the graph.

$F(x) = 2|x + 2| - 1$

4. Find the vertex of the function.

$(-2, -1)$

5. Find the domain of the function.

All Real Numbers

6. Find the range of the function.

$y \geq -1$

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7. If $g(x) = |x + 7|$, write a function $h(x)$ that is $g(x)$ translated down 2 units.

$$h(x) = |x - 7| - 2$$

8. Solve $3|2x + 5| = 12$.

$$|2x + 5| = 4$$

$$2x + 5 = 4$$

$$2x + 5 = -4$$

$$2x = -1$$

$$2x = -9$$

$$\boxed{x = -\frac{1}{2} \quad \text{or} \quad x = -\frac{9}{2}}$$

12. $h(x) = \frac{1}{3}|x - 4| + 15$; $x = -8$

$$h(-8) = \frac{1}{3}|-8 - 4| + 15$$

$$= \frac{1}{3}|-12| + 15$$

$$= \frac{1}{3}(12) + 15$$

$$= 4 + 15$$

$$= 19$$

9. Solve and graph the solutions to $|6 - 2x| - 12 \geq 8$

$$|6 - 2x| \geq 20$$

$$6 - 2x \geq 20$$

or

$$6 - 2x \leq -20$$

$$-2x \geq 14$$

$$-2x \leq -26$$

$$x \leq -7$$

or

$$x \geq 13$$



For 10–12, evaluate each function at the give value of x .

10. $f(x) = \begin{cases} x^2 + 2 & \text{if } x \leq -2 \\ 3x - 12 & \text{if } x > -2 \end{cases}$; $x = -2$

$$\begin{aligned} f(-2) &= (-2)^2 + 2 \\ &= 4 + 2 = 6 \end{aligned}$$

11. $g(x) = 7[x] - 1$; $x = -3.7$

$$\begin{aligned} g(-3.7) &= 7[-3.7] - 1 \\ &= 7(-4) - 1 \\ &= -28 - 1 \\ &= -29 \end{aligned}$$