



**Free Response:**

9. Venetta buys 2 pounds of pecans and 3 pounds of cashews. The pecans cost \$4 more per pound than the cashews. She pays a total of \$48. Identify how much one pound of cashews costs, and how much one pound of pecans costs.

$x$ : pecans  $y$ : cashews  
 $2x + 3y = 48$   
 $2(y+4) + 3y = 48$   
 $2y + 8 + 3y = 48$   
 $5y + 8 = 48$   
 $5y = 40$   
 $y = 8$

Cashews \$8  
Pecans \$12

10. Five friends all use \$2.50 off coupons to buy themselves tickets to the movies. They spend a total of \$57.50. What is the full-price cost of one movie ticket?

$5(x - 2.50) = 57.50$   
 $5x - 12.50 = 57.50$   
 $5x = 70$       $x = 14$      \$14

11. The equation for the volume of a right pyramid is  $V = \frac{1}{3}b \cdot w \cdot h$ , where  $V$  is the pyramid's volume,  $b$  is the measure of the base,  $w$  is the width, and,  $h$  is the height.

a. Solve the equation for  $h$

$3 \cdot V = \frac{1}{3} b w h \cdot 3$   
 $3V = b w h$   
 $h = \frac{3V}{bw}$

b. If a right pyramid has a volume of 60 cubic units, a base measure of 2 units, and a width of 6 units, what is the pyramid's height?

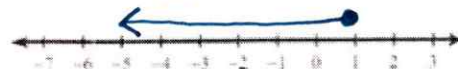
$h = \frac{3(60)}{2 \cdot 6} = \frac{180}{12} = 15$      15 units

12. Solve and graph the following inequalities

a.  $7 - 3x < 28$   
 $-3x < 21$   
 $x > -7$



b.  $5(-x - 1) \geq 10x - 20$   
 $-5x - 5 \geq 10x - 20$   
 $15 \geq 15x$   
 $1 \geq x$



13. Mr. Santo Claws needs to buy special ornaments for decorating at a holiday party. He needs to buy 5 glass ornaments and 3 copper ornaments. The cost of the copper ornaments is \$7 more than the glass ornaments. If he spends a total of \$101, how much do the ornaments cost individually?

$x$ : glass  $y$ : copper  
 $x + 7$

$5x + 3(x + 7) = 101$   
 $5x + 3x + 21 = 101$   
 $8x = 80$   
 $x = 10$

glass \$10  
Copper \$17

Name key

Date \_\_\_\_\_

**Topic 2 Finals Review**

**Multiple Choice:** Select the best answer.

1. Select the linear equation that is *perpendicular* to the line  $y = -2x + 7$  and has a y-intercept at  $(0, -5)$ .

[A]  $y = -2x - 5$

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

[C]  $y = 2x - 5$

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

2. Write the equation for a linear equation in *point slope form* with a slope of  $-2$  and passes through the point  $(3, -4)$ .

[A]  $y + 4 = -2(x - 3)$

[B]  $y - 4 = -2(x - 3)$

[C]  $y + 4 = -2(x + 3)$

[D]  $y - 4 = -2(x + 3)$

3. Calculate the slope of a line that passes through the points  $(1, 7)$  and  $(5, 19)$   $\frac{19-7}{5-1} = \frac{12}{4} = 3$

[A]  $1/3$

[B]  $3$

[C]  $-3$

[D]  $6$

4. Genevieve has \$90 to spend on ping pong paddles and ping-pong balls for her after-school club. Paddles cost \$6 and a set of ping pong balls cost \$5. Write an equation in standard form to model this scenario. Let x represent the number of paddles and y represent the number of balls.

[A]  $-6x + 5y = 90$

[B]  $5x + 6y = 90$

[C]  $6x + 5y = -90$

[D]  $6x + 5y = 90$

5. Write a linear equation in *slope intercept form* that passes through the points  $(2, 13)$  and  $(3, 16)$   $\frac{16-13}{3-2} = \frac{3}{1}$

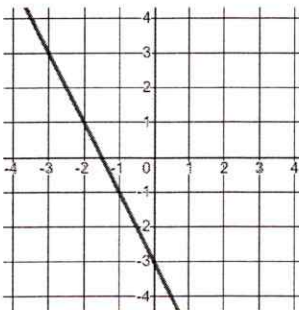
[A]  $y = 3x + 13$

[B]  $y = 3x + 7$

[C]  $y = 2x + 5$

[D]  $y = x + 9$

6. Select the 2 equations that are represented in the graph below.



[A]  $y = \frac{1}{2}x - 3$

[B]  $y = -2x - 3$

[C]  $y - 1 = -2(x + 2)$

[D]  $y + 1 = \frac{1}{2}(x - 2)$

$16 = 3(3) + b$   
 $16 = 9 + b$   
 $7 = b$

**Free Response:**

7. Write the equation of a line that passes through the point  $(-2, 3)$  and is *perpendicular* to the line

$y = \frac{1}{2}x + 7$  in point slope form. Slope  $-2$   $BA = -2(x+2) + b$

$y - 3 = -2(x + 2)$

8. Biologists have discovered that the number of chirps some crickets make per minute is related to the temperature outside. The relationship is linear. When crickets chirp 124 times, it is about 68°F. When they chirp 172 times per minute, it is about 80°F.

a. Define your variables.

$x$ : times crickets chirp  
 $y$ : temperature

b. Identify the two given coordinate points.

$(124, 68)$   $(172, 80)$

c. Calculate the average rate of change (slope). Interpret the meaning in the context of the problem.

$$\frac{172 - 124}{80 - 68} = \frac{48}{12} = \frac{1}{4}$$

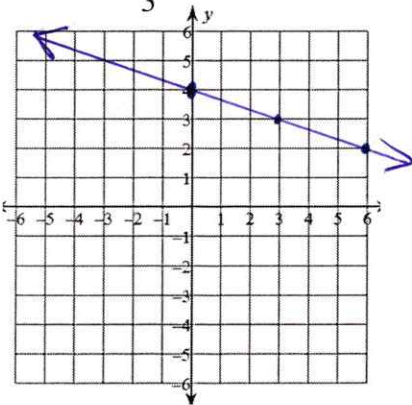
4 chirps for 1°F

d. Write the linear equation in point-slope form.

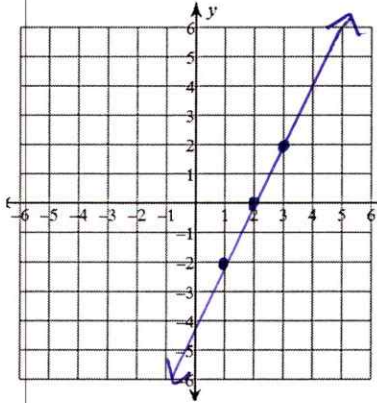
$$y - 68 = \frac{1}{4}(x - 124) \quad \text{or} \quad y - 80 = \frac{1}{4}(x - 172)$$

9. Graph each equation.

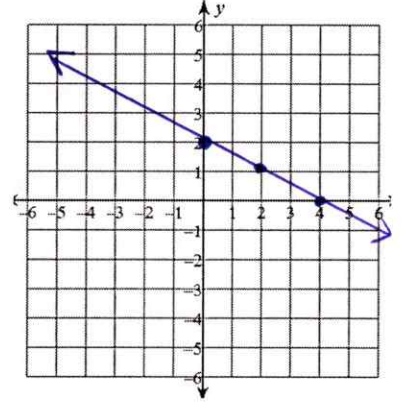
a.  $y = -\frac{1}{3}x + 4$



b.  $y + 2 = 2(x - 1)$

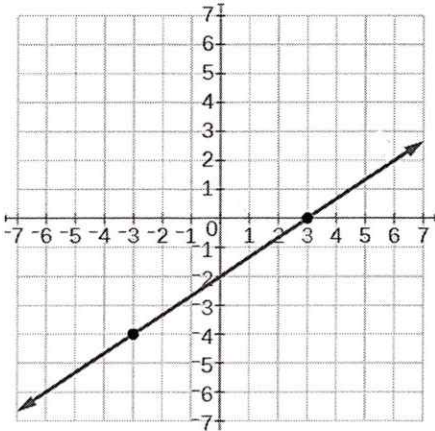


c.  $2x + 4y = 8$



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

10. Use the graph below to answer the following questions.



a. What is the slope of the line?  $\frac{2}{3}$

b. What is the y intercept?  $(0, -2)$

c. What is the x-intercept?  $(3, 0)$

d. Write the equation in point slope form.

Answers will vary

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

e. Write an equation that is parallel to this line that passes through the point  $(3, 4)$ .

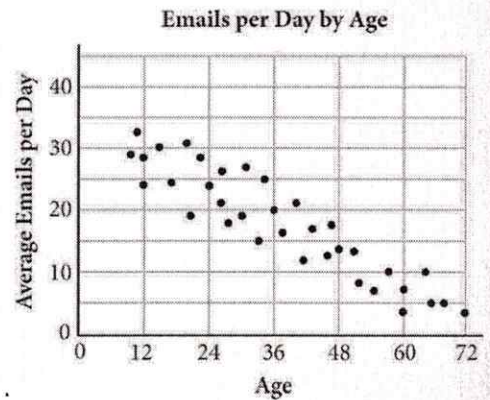
$$y - 4 = \frac{2}{3}(x - 3)$$

### Topic 3 Finals Review

**Multiple Choice:** *Select the best answer.*

1. Which of the following equations best represents the line of best fit of the data shown in the figure.

- [A]  $y = -2.4x + 30$                       [B]  $y = -1.2x + 40$   
 [C]  $y = -0.8x + 40$                        [D]  $y = -0.4x + 36$



2. Which recursive rule best describes the sequence -5, -3, -1, 1, ...

- [A]  $a_1 = -3$   
 $a_n = a_{n-1} - 4$                        [B]  $a_1 = -5$   
 $a_n = a_{n-1} + 2$                       [C]  $a_1 = 2$   
 $a_n = a_{n-1} - 5$                       [D]  $a_1 = -5$   
 $a_n = a_{n-1} - 3$

3. Which recursive rule best describes the sequence 3, 14, 25, 36, ...

- [A]  $a_1 = 3$   
 $a_n = a_{n-1} + 8$                       [B]  $a_1 = 11$   
 $a_n = a_{n-1} + 3$                        [C]  $a_1 = 3$   
 $a_n = a_{n-1} + 11$                       [D]  $a_1 = 2$   
 $a_n = a_{n-1} + 8$

4. Which explicit rule best describes the sequence 7, 23, 39, 55, ...

- [A]  $a_n = 7 + 16(n-1)$                       [B]  $a_n = 23 + 7(n-1)$                       [C]  $a_n = 16 + 7(n-1)$                       [D]  $a_n = 7 + 23(n-1)$

5. Which  $r$ -value suggests a strong positive correlation?

- [A]  $r = 0.17454$                       [B]  $r = -0.17454$                        [C]  $r = 0.9964$                       [D]  $r = -0.9626$

6. Which of the following sequences are arithmetic? **Select ALL that apply**

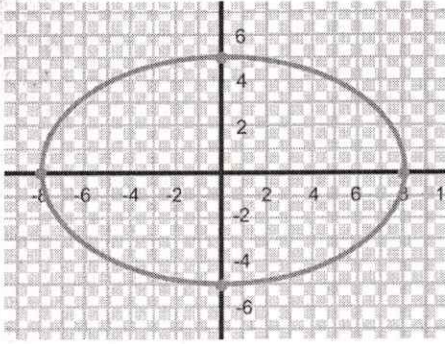
- [A] -30, -40, -50, -60, ...                       [B] 35, 32, 29, 26, ...                       [C] -3, -23, -43, -63, ...                      [D] 7, 14, 28, 56, ...

**Free Response:**

7. For each graph, state whether it is a function and discrete or continuous then state the domain and range of each on the next page.

Discrete or Continuous

a. Function? No

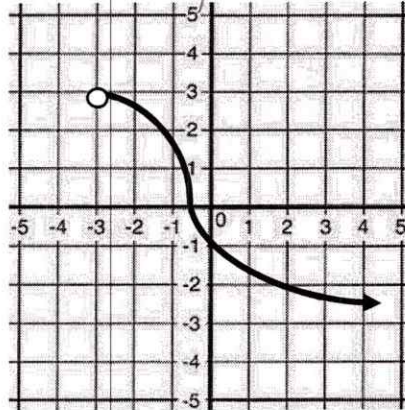


Domain:  $-8 \leq x \leq 8$

Range:  $-6 \leq y \leq 6$

Discrete or Continuous

b. Function? yes

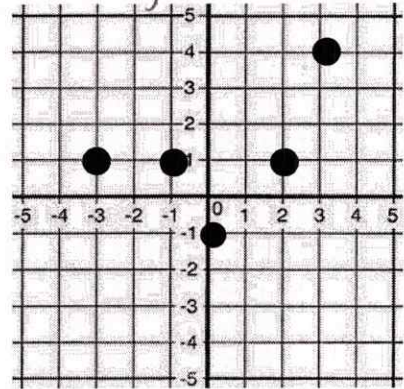


Domain:  $-3 < x < \infty$

Range:  $-\infty < y < 3$

Discrete or Continuous

c. Function? yes



Domain:  $\{-3, -1, 0, 2, 3\}$

Range:  $\{-1, 1, 4\}$

8. Given  $f(x) = 2x - 1$ ,  $g(x) = x^2$ , and the graph of  $h(x)$  evaluate each of the following.

a.  $f(-4)$

$$2(-4) - 1$$

$$-8 - 1$$

$$\underline{-9}$$

c.  $x$ , when  $h(x) = 4$

$$x = 2 \text{ and } x = 6$$

b.  $h(1) + g(2)$

$$2 + 2^2$$

$$2 + 4$$

$$\underline{6}$$

d.  $f(0) + h(3)$

$$2(0) - 1 + 2$$

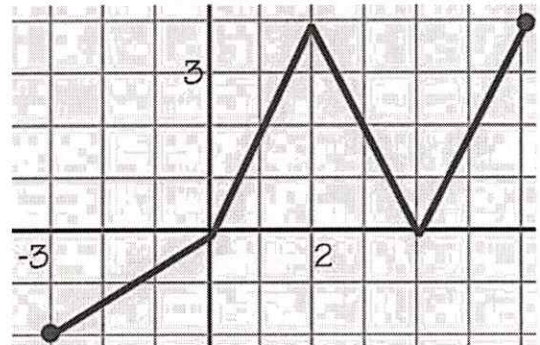
$$-1 + 2$$

$$\underline{1}$$

e.  $x$ , when  $f(x) = 7$   $7 = 2x - 1$

$$8 = 2x$$

$$\underline{x = 4}$$



9. State whether each is a function and then state the domain and range.

X	Y
1	3
3	4
-3	8
4	6
7	8

a. Function? yes

Domain:  $\{-3, 1, 3, 4, 7\}$

Range:  $\{3, 4, 6, 8\}$

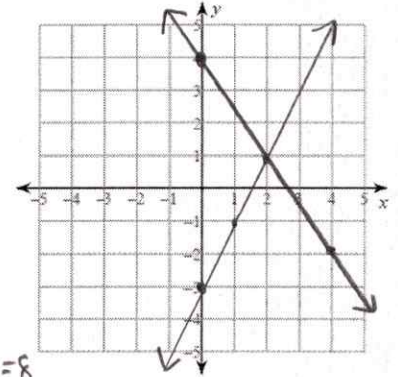
b.  $(1, 3), (2, 6), (0, 6), (1, 4)$

Function? No

Domain:  $\{0, 1, 2\}$

Range:  $\{3, 4, 6\}$

## Topic 4 Finals Review



**Multiple Choice:** Select the best answer.

1. Solve the systems of equations by graphing.  $y = 2x - 3$   
 $y = -\frac{3}{2}x + 4$

[A] (2, -1)                      **[B] (2, 1)**  
 [C] (-2, -1)                    [D] No Solution

2. Solve the system of equations by substitution.  $y = -4x + 1$   
 $8x + 8y = 8$

[A] (1, 0)                      **[B] (0, 1)**                      [C] (-1, 1)                      [D] (1, 1)

$$\begin{aligned} 8x + 8(-4x + 1) &= 8 \\ 8x - 32x + 8 &= 8 \\ -24x &= 0 \\ x &= 0 \end{aligned}$$

3. Solve the system of equations by substitution.  $-5x + 6y = 18$   
 $x + 8y = 24$

[A] (-1, -1)                      [B] (-1, 3)                      [C] (0, -3)                      **[D] (0, 3)**

$$\begin{aligned} -5(-8y + 24) + 6y &= 18 \\ 40y - 120 + 6y &= 18 \\ 46y &= 138 \\ y &= 3 \\ x &= -8(3) + 24 \\ x &= 0 \end{aligned}$$

4. Solve the system of equations by elimination.  $-6x + y = 8$   
 $-8x - y = 20$

[A] (-4, -4)                      **[B] (-2, -4)**                      [C] (2, -4)                      [D] (-2, 4)

$$\begin{aligned} -6x + y &= 8 \\ -8x - y &= 20 \\ \hline -14x &= 28 \\ x &= -2 \end{aligned}$$

5. Solve the system of equations by elimination.  $-x + 4y = 9$   
 $4x - 10y = -24$

[A] (-1, -2)                      [B] (1, -2)                      **[C] (-1, 2)**                      [D] (1, 2)

$$\begin{aligned} -x + 4y &= 9 \\ -4x + 16y &= 36 \\ 4x - 10y &= -24 \\ \hline 6y &= 12 \\ y &= 2 \\ -x + 4(2) &= 9 \\ -x + 8 &= 9 \\ -x &= 1 \\ x &= -1 \end{aligned}$$

6. Sarah has \$25 dollars and earns \$10 per week from tutoring. She wants to have at least \$120 by the end of the summer. Write a linear inequality that represents this scenario, where  $x$  represents the number of weeks Caroline works.

**[A]**  $10x + 25 \geq 120$                       [B]  $10x + 25 > 120$                       [C]  $10x + 25 < 120$                       [D]  $10x + 25 \leq 120$

7. You need at least 3 pounds of fruit to make muffins. Blueberries cost \$4 per pound, strawberries cost \$3 per pound, and you can spend at most \$21 on fruit. Write a system of inequalities for this scenario, where  $x$  is blueberries and  $y$  is strawberries.

[A]  $x + y \geq 3$                       [B]  $x + y < 3$                       **[C]  $x + y \geq 3$**                       [D]  $x + y \leq 3$

$4x + 3y \geq 21$                        $3x + 4y \geq 21$                        $4x + 3y \leq 21$                        $3x + 4y \leq 21$

**Free Response:**

8. Solve the systems of equations by graphing.

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

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

$$(-4, -4)$$

9. Solve the system of equations by any method.

$$x + 5y = 4 \rightarrow x = -5y + 4$$

$$6x - 5y = 24$$

$$x = -5(0) + 4$$

$$x = 4$$

$$6(-5y + 4) - 5y = 24$$

$$-30y + 24 - 5y = 24$$

$$-35y = 0$$

$$y = 0$$

$$(4, 0)$$

10. Solve the system of equations by any method.

$$6x - 6y = 0 \rightarrow 6x - 6y = 0$$

$$-2x + 2y = 7 \rightarrow -6x + 6y = 21$$

$$0 \neq 21$$

No solution

12. The senior classes at Issaquah and Skyline planned separate trips to Portland. The senior class at Issaquah rented 1 van and 6 buses with 372 students. Skyline rented 4 vans and 12 buses with 780 students. Each van and each bus carried the same number of students. Write and solve a system of equations to determine how many students can fit in a van and how many students can fit in a bus.

$$v + 6b = 372$$

$$v = -6b + 372$$

$$4(-6b + 372) + 12b = 780$$

$$-24b + 1488 + 12b = 780$$

$$-12b = -708$$

$$b = 59$$

$$4v + 12b = 780$$

$$v = -6(59) + 372$$

$$v = 18$$

van: 18  
students  
bus: 59  
students

13. Which of these points are in the solution set of the system of inequalities? (Select all that apply.)

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

$$y < -\frac{1}{2}x + 2$$

[A] (2, 1)

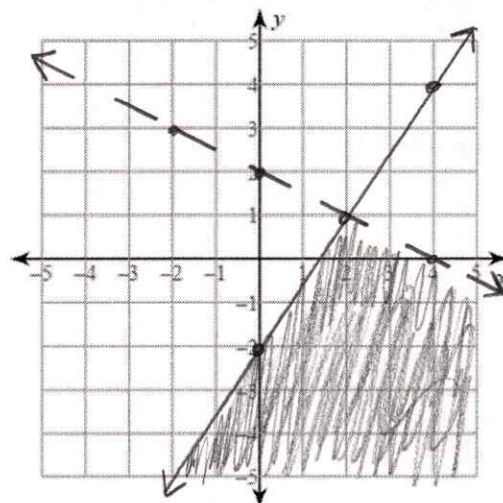
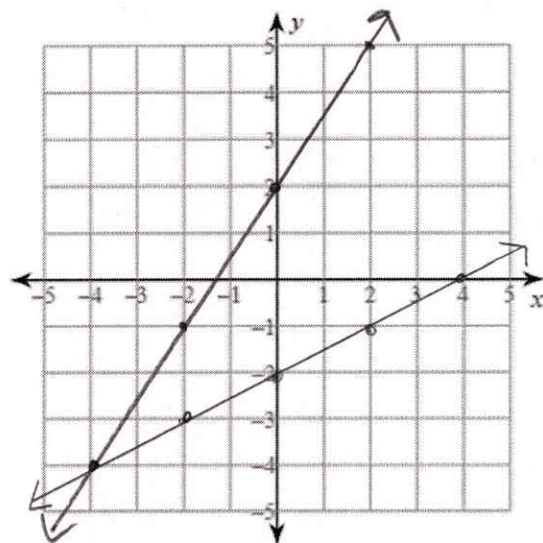
[B] (-2, 0)

[C] (0, -2)

[D] (2, -3)

[E] (4, 4)

[F] (4, 0)





## Topic 6 Finals Review

**Multiple Choice:** Select the best answer.

Simplify:  $\frac{8x^3y^7}{4x^6y}$       $2x^{-3}y^6$

[A]  $\frac{4y^6}{x^9}$

[B]  $\frac{4x^{-3}}{y^6}$

[C]  $\frac{2y^6}{x^3}$

[D]  $2x^3y^7$

2. Simplify:  $10xy^4 \cdot \frac{1}{2}x^2y$

[A]  $5x^2y^5$       $5x^3y^5$

[B]  $5x^2y^5$

[C]  $5x^2y^5$

[D] None of the above

3. Simplify:  $(4xy)(-2x^3y)(3x^4y^5)$

[A]  $-24x^7y^5$       $-24x^8y^7$

[B]  $\frac{1}{24x^8y^7}$

[C]  $-24x^8y^7$

[D]  $-9x^8y^7$

4. Simplify:  $\sqrt[5]{x^4}$

[A]  $x^{5/4}$

[B]  $x^{4/5}$

[C]  $x$

[D]  $x^9$

5. Simplify:  $(5xy^3)^2$

[A]  $5xy^6$

[B]  $25x^2y^6$

[C]  $25xy^5$

[D]  $5x^2y^6$

6. Given the function,  $f(x) = 3 \cdot 1.12^x$ , identify the growth/decay rate.

[A]  $0.12\%$   
 $12\%$

[B]  $0.12\%$

[C]  $112\%$

[D]  $1.12\%$

7. Under perfect conditions a certain bacteria increases by 10% every day. When first measured a petri dish has 1000 bacteria. Which function represents the amount of bacteria after  $x$  days?

[A]  $f(x) = 1000(1.1)^x$

[B]  $f(x) = 1000(10)^x$

[C]  $f(x) = 10(1000)^x$  [D]  $f(x) = 1000(0.1)^x$

8. Find the common ratio for the geometric sequence 2, 8, 32, 128, ...

[A]  $r = 6$

[B]  $r = 4$

[C]  $r = 8$

[D]  $r = 2$

9. Which exponential function represents the table of values?

x	0	1	2	3
f(x)	3	15	75	375

[A]  $f(x) = 5(3)^x$

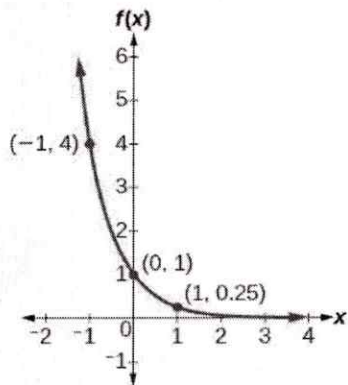
[B]  $f(x) = 3(5)^x$

[C]  $f(x) = 5 + 10x$

[D]  $f(x) = 5(15)^x$

**Free Response:**

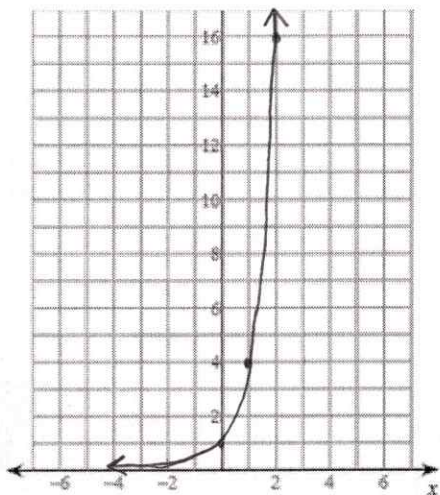
10. Write an exponential function to represent the function graphed below.



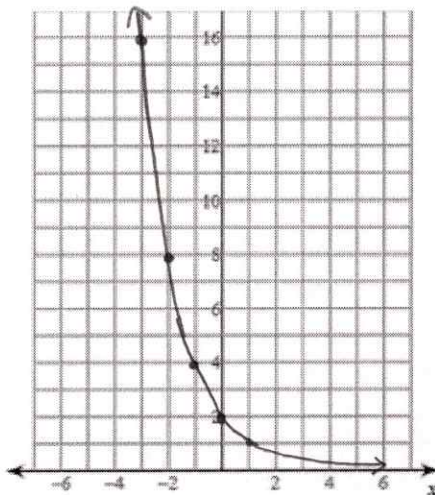
$$f(x) = \left(\frac{1}{4}\right)^x$$

11. Graph the exponential functions.

a)  $f(x) = (4)^x$



b)  $f(x) = 2\left(\frac{1}{2}\right)^x$



12. Tell whether each equation is true or false. If it is false, change the right side to make the equation true.

a)  $(2x^3)^3 = 6x^6$   
False  
 $= 8x^9$

b)  $2(3x^3)^{-1} = -6x^{-2}$   
False  
 $= \frac{2}{3x^3}$

13. You invest \$25,000 in an account that gets 12% annual interest.

a) Write an exponential function to represent the balance in the account after  $x$  years.

$$y = 25000(1.12)^x$$

b) How much would you have in 10 years?

$$y = 25000(1.12)^{10}$$

\$ 77,141.21