Chapter 1 Test

Form A

1. Determine which of the following relations indicates that y is NOT a function of x.

   a. Relationship 1: The number of minutes, *y,* billed to a cell phone on a given day, *x*, in June.
   Relationship 2: The price per credit hour, *y* (in dollars), at a major research university, *x* (name of university), in the US.
   Relationship 3: The grandmother, *y* (name of grandmother), of a child, *x* (name of child), in one family.

   b.

Table 1

x	-2	-1	0	1	2
y	5	2	3	1	7

Table 2

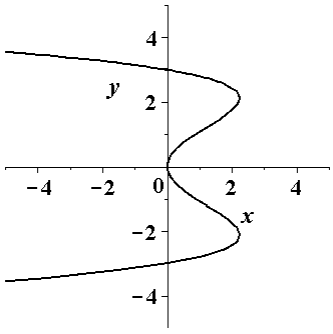
x	2	1	0	1	2
y	a	b	c	c	a

Table 3

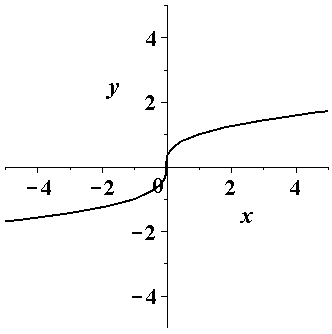
x	1	2	3	1	2
y	T	F	T	T	F

   c.

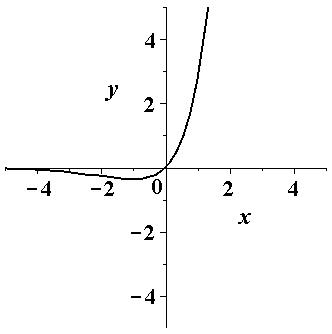
Graph 1



Graph 2



Graph 3



   d. Equation 1: $x^2 + y^2 = 4$
   Equation 2: $3x^3 - 2y = 7$
   Equation 3: $2e^x - y + 7 = 0$

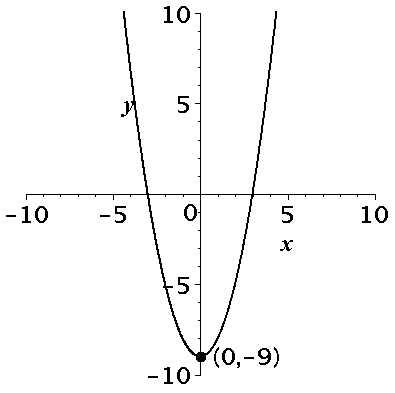
Form A

2. Determine the domain and range for each function.

a.

x	4	2	1	3	6
$f(x)$	7	5	2	0	3

b.



c. $f(x)=\frac{1}{3}x+6$

3. The membership of a gym from 1995 to 2010 is given by the function $M(x)=18x+65$ people, x years after the gym, was founded in 1995.

   a. What is the membership of the gym in 2001?

   b. Find and interpret the y-intercept of the function.

   c. Find the rate of change in the number of members at the gym.

4. Find the slope and y-intercept for each linear equation.

   a. $y = 11 - 3x$

   b. $2x - 5y = 20$

   c. $y = \frac{4}{3}x$

5. Graph each function using graphing technology and a standard viewing window of [-10, 10] and [-10, 10]. Determine the *x*-intercept(s) and *y*-intercept of each function, if they exist.

   a. $y = -3x + 8$

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

   c. $y = 4x^4 + 4x^3 - 8x^2$

6. Write the equation of a line through the point (1, -2) with the given conditions.

   a. parallel to $3x + y = 6$

   b. perpendicular to $y = \frac{1}{3}x - 5$

   c. perpendicular to the *x*-axis

7. Write the equation of a line with the given conditions.

   a. slope of 3 and a y-intercept of -4

   b. slope of -3 and passing through the point (2, 1)

   c. passing through the two points (-3, 5) and (5, 1)

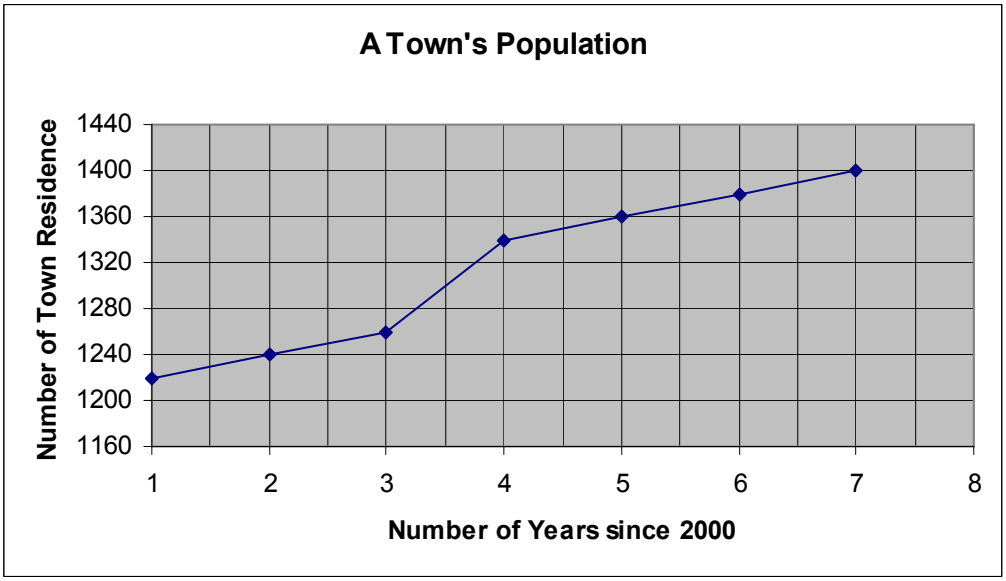
8. The table shows the revenue earned by a certain company from 2005 to 2009.

Year	2005	2006	2007	2008	2009
Revenue(in thousands of dollars)	672	715	758	801	844

a. Find the linear model where x is the number of years after 2005, and y is the revenue in thousands of dollars.

b. Use the model to predict the revenue that will be earned by the company in 2016.

9. The points of the figure below give the population of a certain town as a function of the number of years since 2000.



a. What is the domain of the function?

b. Approximately, what was the town's population in 2003?

c. Approximately, in what year was the town's population 1360?

10. The price of gas, p (in dollars), for a gallon of gas in a region of the US is given by the function

$$p(x) = 0.000003x^3 - 0.0005x^2 + .02x + 3.57$$

where x is the number of days since May 1, 2010.

a. What is $p(25)$? (Round your answer to the nearest hundredth.)

b. On what day is the gas \$3.65? (Use graphing technology to graph the function *p(x),* and for $0 \le x \le 20$.)

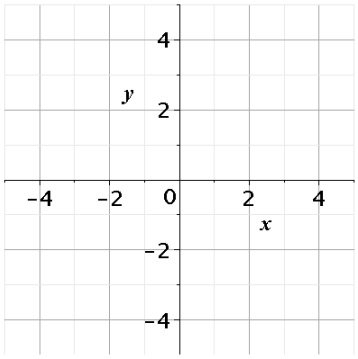
Form A

11. Sketch the graph of the function on the grid provided, and label all intercept(s).

a. $y = 3x - 4$

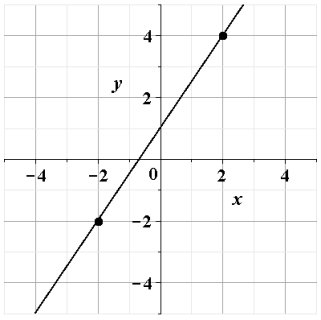
b. $y = x^2 - 4$

c. $y = \sqrt{-x+2} - 3$



12. Write the equation of the line for the following:

a.



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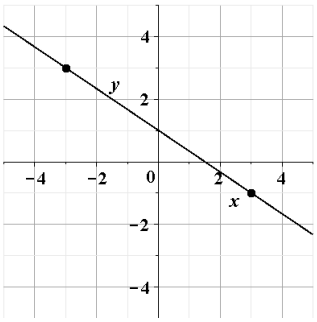
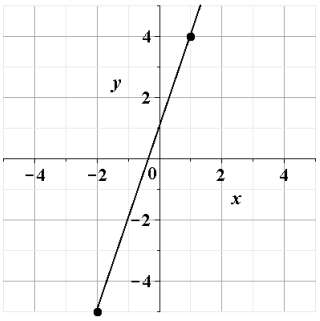


c.



Chapter 1 Test

Form B

1. Determine which of the following relations indicates that y is NOT a function of x.

   a. Relationship 1: The number of miles, *y,* on the meter of a taxi on one fare during the day, *x*.
   Relationship 2: The price, *y* (in dollars), of a calculus textbook at one publisher, *x* (name of textbook).
   Relationship 3: The grandfather, *y* (name of grandfather), of a child, *x* (name of child), in one family.

   b.

Table 1

x	2	1	0	1	2
y	5	2	3	1	7

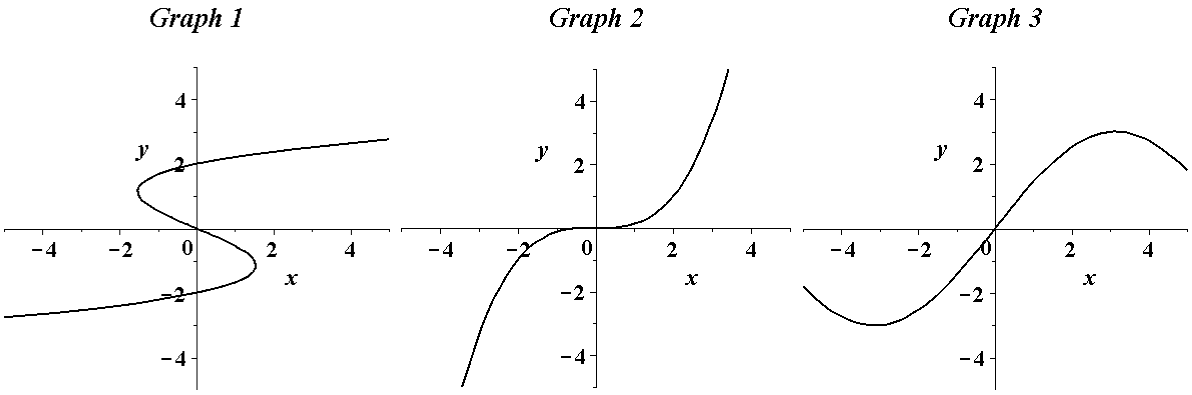
Table 2

x	-2	-1	0	1	2
y	a	b	c	c	a

Table 3

x	1	2	3	1	2
y	T	F	T	T	F

   c.



   d. Equation 1: $\frac{3}{x} - 2y = 4$

   Equation 2: $3x^3 - 2y^4 = 9$

   Equation 3: $4^x - y + 17 = 0$

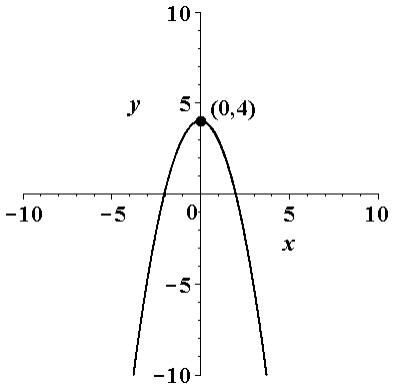
Form B

2. Determine the domain and range for each function.

a.

x	-4	-2	1	3	6
$f(x)$	-1	1	4	7	9

b.



c. $f(x)=\frac{5}{8}x-10$

3. The number of fish in a pond is given by $N(t)=18t+24$, t years after 12 pairs were first placed in the pond.

   a. How many fish are in the pond 4 years after the pairs were placed in the pond?

   b. Find and interpret the *y*-intercept of the function.

   c. What is the rate of change in the number of fish in the pond?

Form B

4. Find the slope and y-intercept for each linear equation.

   a. $y = 4 - 7x$

   b. $2x + 6y = 18$

   c. $x = -7$

5. Graph each function using graphing technology and a standard viewing window of [-10, 10] and [-10, 10]. Determine the x-intercept(s) and y-intercept of each function, if they exist.

   a. $y = -3x + 2$

   b. $y = \dfrac{2}{x+1}$

   c. $y = 2x^4 + 2x^3 - 40x^2$

6. Write the equation of a line through the point (2, 1) with the given conditions.

   a. parallel to $4x + 2y = 6$

   b. perpendicular to $y = \dfrac{1}{2}x + 4$

   c. perpendicular to the *x*-axis

7. Write the equation of a line with the given conditions.

   a. slope of $-\dfrac{1}{3}$ and a *y*-intercept of 4

   b. slope of 2 and passing through the point (-1, 5)

   c. passing through the two points (-4, 7) and (4, -1)

Form B

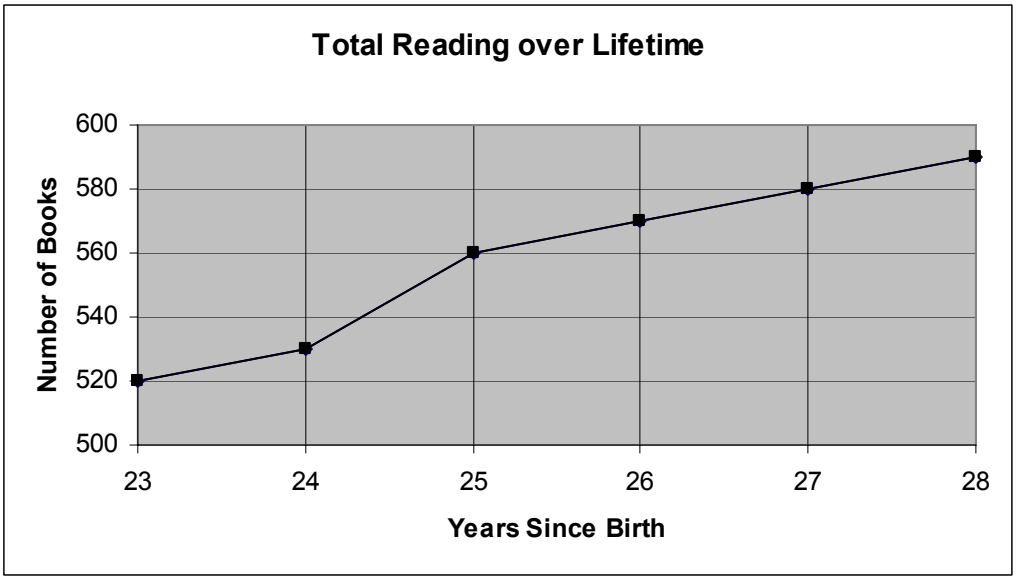
8. The table shows the revenue earned by a certain company from 2005 to 2009.

Year	2005	2006	2007	2008	2009
Revenue(in thousands of dollars)	428	465	502	539	576

a. Find the linear model where x is the number of years after 2005, and y is the revenue in thousands of dollars.

b. Use the model to predict the revenue that will be earned by the company in 2016.

9. The points on the figure below give the total number of books a certain man has read during his lifetime as a function of the number of years since his birth.



a. What is the domain of the function?

b. Approximately, how many books have been read by the time the man reached age 24?

c. Approximately, by what age had the man read 570 books?

10. The time, t (in minutes), it takes to get to class from your room everyday is given by the function

$$t(x) = -0.0384x^3 + 0.238x^2 - 0.393x + 8.02$$

where x is the number of days since the start of the semester.

a. What is $t(7)$? (Round your answer to the nearest hundredth.)

b. Approximately how many days have gone by if it takes you 7.12 minutes to get to class from your room? (Use graphing technology to graph the function *t(x),* and for $0 \le x \le 10$.)

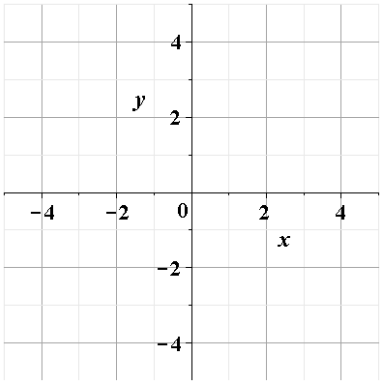
Form B

11. Sketch the graph of the function on the grid provided, and label all intercept(s).

a. $y = -2x + 3$

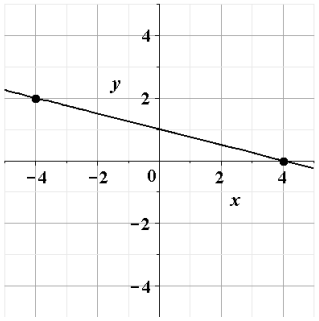
b. $y = \sqrt{x} - 4$

c. $y = -|x| + 3$

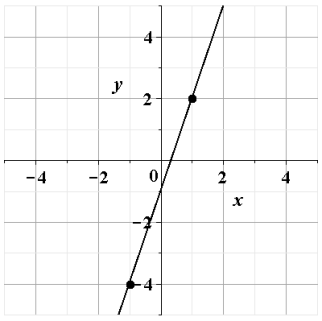


12. Write the equation of the line for the following:

a.



b.



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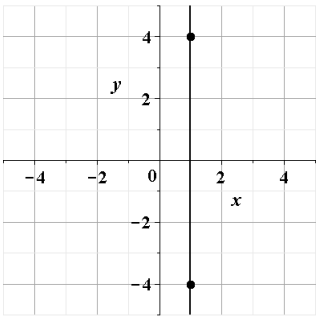


Chapter 1 Test

Form C

1. Determine which of the following relations indicates that y is NOT a function of x.

   a. Relationship 1: The number of songs, *y,* on a single CD, *x* (name of CD).
   Relationship 2: The salary of a person, *y* (in dollars), based on the number of years employed, *x* (in years).
   Relationship 3: The uncle, *y* (name of uncle), of a child, *x* (name of child), in a family where the father has 3 brothers.

   b.

Table 1

x	1	2	3	1	2
y	5	2	3	1	7

Table 2

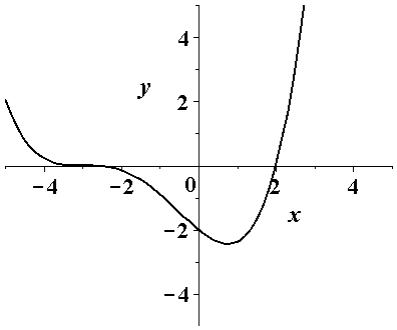
x	2	1	0	1	2
y	a	b	c	b	a

Table 3

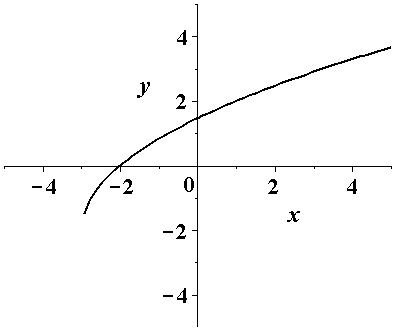
x	-2	-1	0	1	2
y	T	F	T	T	F

   c.

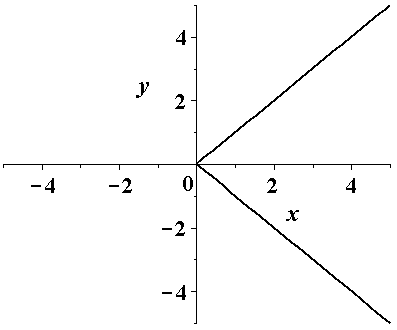
Graph 1



Graph 2



Graph 3



   d. Equation 1: $\sqrt{x}-2y=4$
   Equation 2: $y^4=x^2-9$
   Equation 3: $y+8=0$

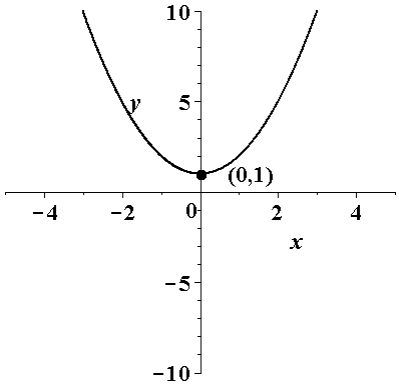
Form C

2. Determine the domain and range for each function.

a.

x	-2	0	2	4	6
$f(x)$	-3	1	5	9	13

b.



c. $f(x)=\frac{3}{4}x-6$

3. The population of a certain town is given by $P(t)=40t+890$ people, t years after 2005.

a. What was the town's population?

b. Find and interpret the *y*-intercept of the function.

c. Find the rate of change in the town's population.

Form C

4. Find the slope and y-intercept for each linear equation.

   a. $y = 9 - 7x$

   b. $4x + 3y = 12$

   c. $y = 2$

5. Graph each function with a graphing calculator using the standard viewing window. Determine the x-intercept(s) and y-intercept of each function, if they exist.

   a. $y = 2x + 7$

   b. $y = \dfrac{-2}{2x + 1}$

   c. $y = -2x^4 - 6x^3 + 8x^2$

6. Write the equation of a line through the point (4, -1) with the given conditions.

   a. parallel to $-4x + 2y = 6$

   b. perpendicular to $y = \dfrac{1}{5}x + 4$

   c. perpendicular to the *x*-axis

7. Write the equation of a line with the given conditions.

   a. slope of $\dfrac{2}{3}$ and a *y*-intercept of 5

   b. slope of -1 and passing through the point (2, 1)

   c. passing through the two points (2, 5) and (-3, 5)

Form C

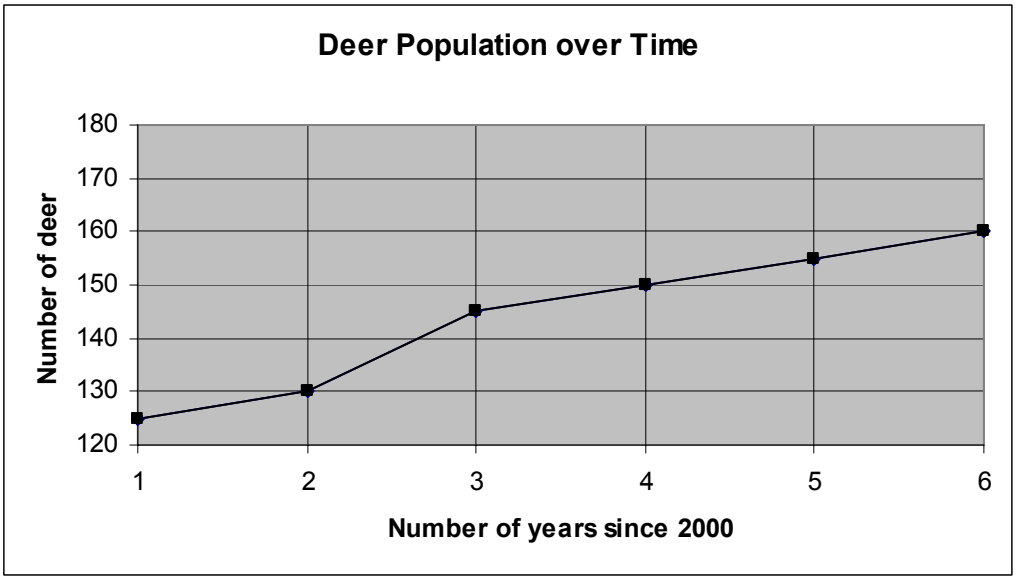
8. The table shows the revenue earned by a certain company from 2005 to 2009.

Year	2005	2006	2007	2008	2009
Revenue(in thousands of dollars)	584	645	706	767	828

a. Find the linear model where x is the number of years after 2005, and y is the revenue in thousands of dollars.

b. Use the model to predict the revenue that will be earned by the company in 2016.

9. The points on the figure below give the deer population at a certain national park as a function of the number of years since 2000.



a. What is the domain of the function?

b. Approximately, how many deer lived in the nation park in 2003?

c. Approximately, in what year were there 155 deer living in the national park?

10. The price for a gallon of 2% milk, p (in dollars), over the last six years is given by the function

$$p(x) = 0.0305x^3 - 0.1985x^2 + 0.463x + 2.95$$

where x is the number of years since 2003.

a. What is $p(4)$? (Round your answer to the nearest hundredth.)

b. Approximately, in what year did a gallon of milk cost \$3.26? (Use graphing technology to graph the function *p(x),* and for $0 \le x \le 5$.)

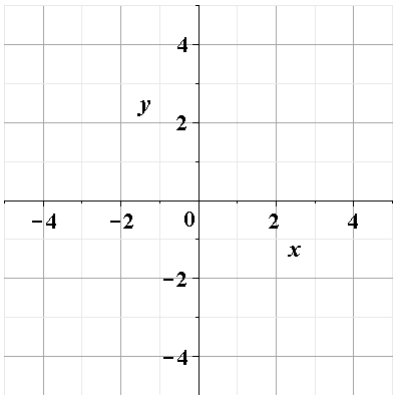
Form C

11. Sketch the graph of the function on the grid provided, and label all intercept(s).

a. $y = |x - 3| - 4$

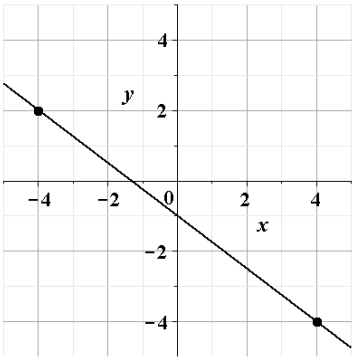
b. $y = -x^2 + 4$

c. $y = -\sqrt{x - 4}$



12. Write the equation of the line for the following:

a.



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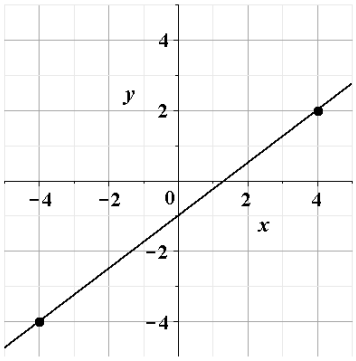

c.