TEST BANK

college algebra
in context

with applications for the managerial,
life, and social sciences

Third Edition

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Chapter 1 Test
Form A

1. Determine the domain and range for each function.

a.

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

b.
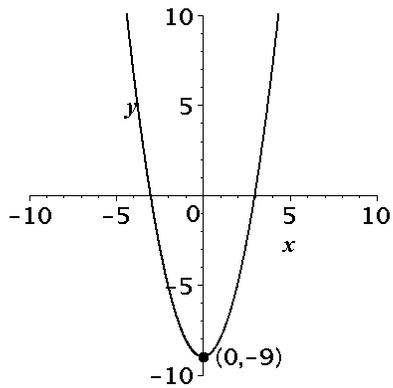
(0,–9)

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

2. Determine which of the following relations indicates that y is <u>NOT</u> 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

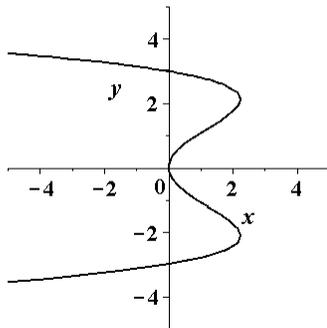| x	-2	-1	0	1	2
y	5	2	3	1	7

Table 2

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

Table 3

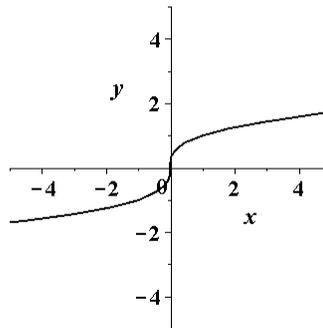| x	1	2	3	1	2
y	T	F	T	T	F

   c.
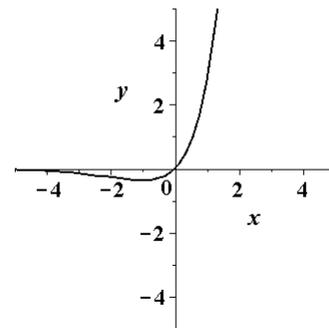
Graph 1 *Graph 2* *Graph 3*

   d. Equation 1: $x^2 + y^2 = 4$

        Equation 2: $3x^3 - 2y = 7$

        Equation 3: $2e^x - y + 7 = 0$

3. The membership of a popular club from 1990 to 2000 is given by the function $N(x) = 22x + 18$ people, x years after the club was founded in 1990.

   a. What is the membership of the club in 1995?

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

   c. Find the rate of change in the number of members in the club.

Chapter 1 Test
Form A

4. 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. $y = 2x - 4$

   b. $y = \dfrac{3}{x+1}$

   c. $y = 2x^3 - 6x^2$

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

   a. $y = 7 - 2x$

   b. $5x - 3y = 15$

   c. $y = \dfrac{1}{3}x$

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

   a. slope of 2 and a y-intercept of 4

   b. slope of -3 and passing through the point (6, 1)

   c. passing through the two points (-3, 5) and (6, 2)

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

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

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

   c. perpendicular to the *x*-axis

8. The table shows the number of books checked out from a village library by local residents from 1995 through 1999.

Year	1995	1996	1997	1998	1999
Books (in thousands)	412	476	540	604	668

    a. Find the linear model where x is the number of years after 1995, and y is the number of books in thousands.

    b. Use the model to predict the number of books that will be checked out of the library in 2004.

9. The price of gas, p (in dollars), for a gallon of gas in a region of the US is given by the function
$$p(x) = 0.000005x^3 - 0.0004x^2 + .02x + 3.59$$
where x is the number of days since May 1, 2008.

    a. What is $p(20)$? (Round your answer to the nearest hundredth.)

    b. On what day is the gas $3.68? (Use graphing technology to graph the function p(x), and for $0 \le x \le 20$.)

10. Social Security benefits are based on the number of years an individual works and if they have Social Security withheld from their paychecks. The points on the figure below give the amount of monthly Social Security benefits in dollars as a function of the number of years an individual has worked.
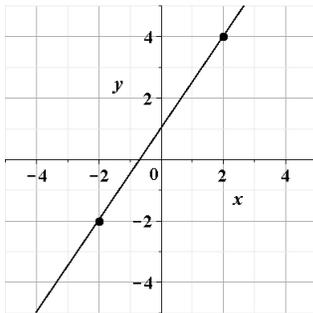
Social Security Benefits
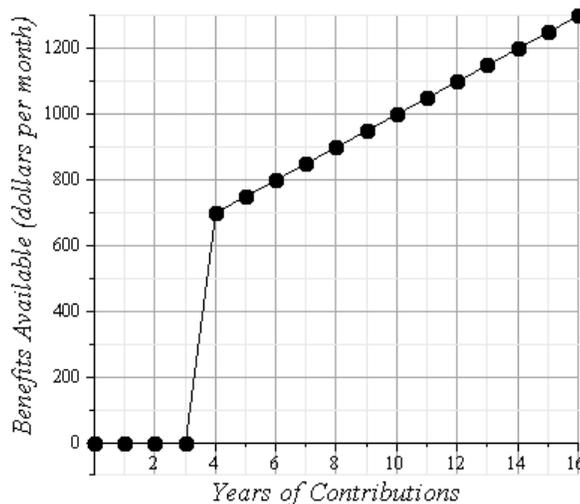
    a. What is the domain of the function?

    b. Approximately, how much does a person receive in monthly benefits, if they have worked 3 years?

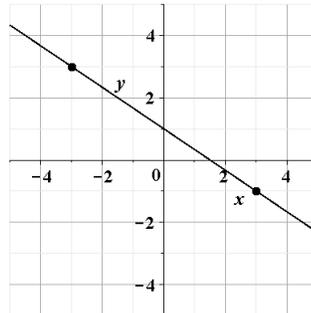   c. Approximately, how many years has someone worked, if they receive $950 in monthly benefits?

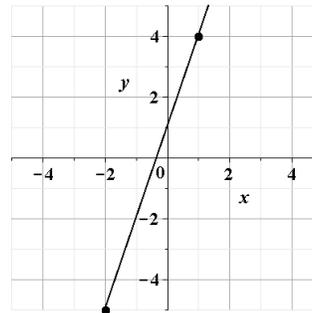11. Write the equation of the line for the following:
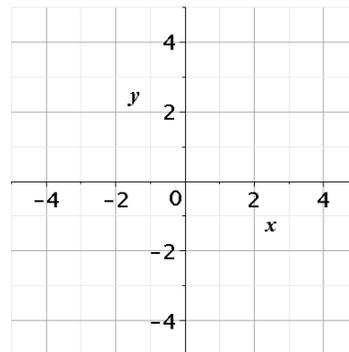
a.

b.

c.

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

a. $y = 3x - 4$

b. $y = x^2 - 4$
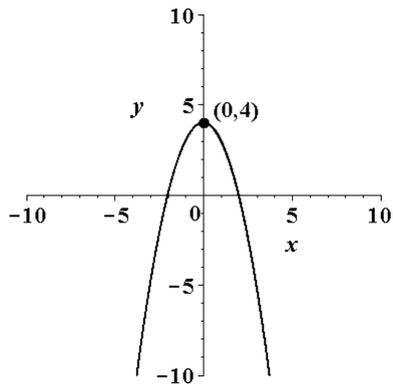
c. $y = \sqrt{-x+2} - 3$

Chapter 1 Test
Form B

1. Determine the domain and range for each function.

a.

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

b.

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

2. Determine which of the following relations indicates that y is <u>NOT</u> 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.
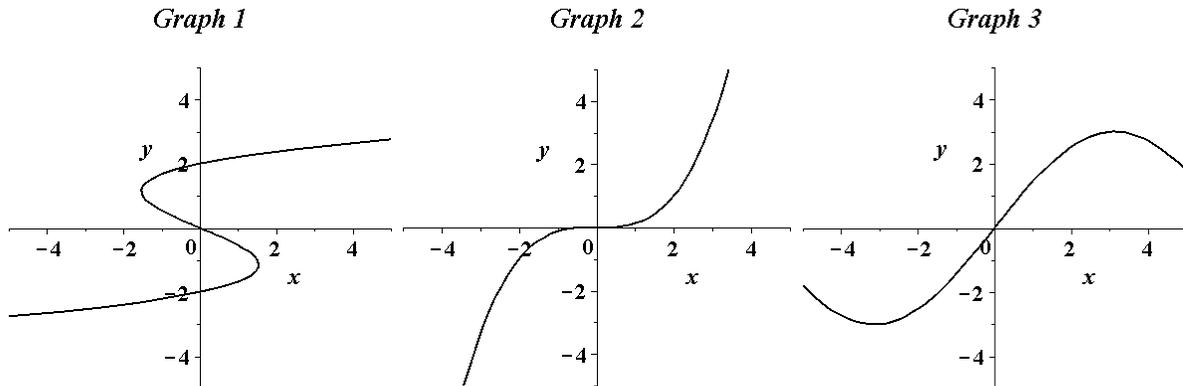
    b.

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.

Graph 1   *Graph 2*   *Graph 3*

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

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

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

3. The absorption of a certain drug into the body is given by $A(x) = -0.084x + 0.42$ grams, x hours after the drug was taken.

    a. How much of the drug is absorbed into the body 3 hours after it was taken?

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

    c. What is the rate of change in the absorption of the drug into the body?

4. 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. $y = 5x - 1$

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

    c. $y = 3x^3 + 6x^2$

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

    a. $y = 5 - 2x$

    b. $3x + 2y = 12$

    c. $x = -4$

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

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

    b. slope of -4 and passing through the point (2, 1)

    c. passing through the two points (2, 9) and (-6, 5)

7. Write the equation of a line through the point (3, 4) with the given conditions.

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

    b. perpendicular to $y = \dfrac{1}{3}x + 4$

    c. perpendicular to the *x*-axis

8. The table shows the dividends per share of HWK, Inc. stock from 1990 through 1994.

Year	1990	1991	1992	1993	1994
Dividends (in dollars)	0.16	0.20	0.24	0.28	0.32

   a. Find the linear model where x is the number of years after 1990, and y is the dividends in dollars.

   b. Use the model to predict the dividends per share of HWK, Inc. for 2005.

9. The time, t (in minutes), it takes to get to class from your room everyday is given by the function
$$t(x) = -0.0284x^3 + 0.238x^2 - 0.393x + 8.194$$
where x is the number of days since the start of the semester.

   a. What is $t(5)$? (Round your answer to the nearest hundredth.)

   b. Approximately how many days have gone by if it takes you 7.364 minutes to get to class from your room? (Use graphing technology to graph the function $t(x)$, and for $0 \le x \le 10$.)

10. Lung cancer deaths are based on the number of cigarettes an individual smokes per day on a regular basis. The points on the figure below give the number of deaths in people as a function of the number of cigarettes an individual has smoked per day.
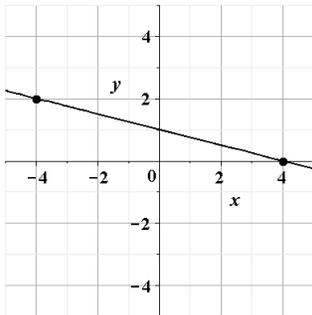

Mortality Rate from Lung Cancer
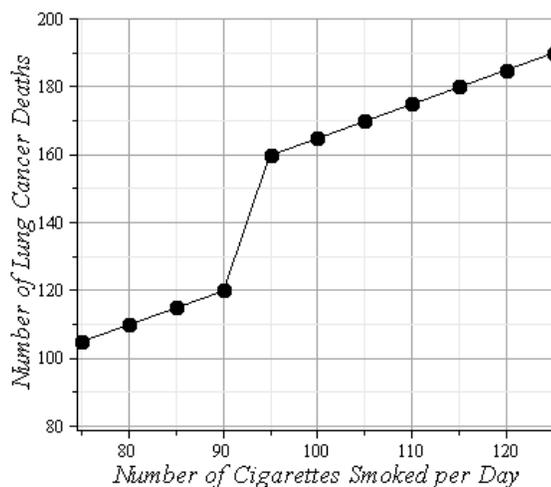
   a. What is the domain of the function?

   b. Approximately, how many deaths from lung cancer were there, if they smoked 105 cigarettes a day?

   c. Approximately, how many cigarettes have they smoked per day, if deaths from lung cancer are at 120 people?
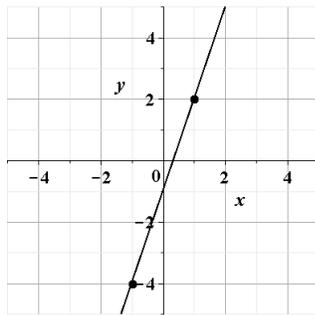
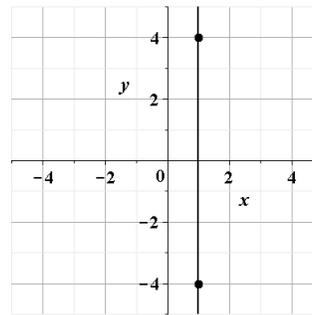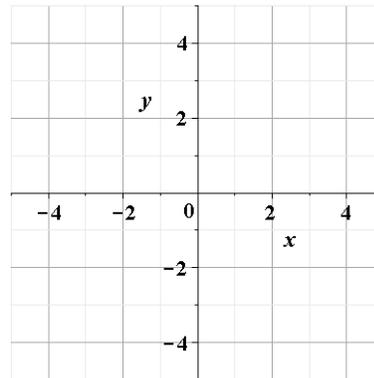11. Write the equation of the line for the following:

a.

b.

c.

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

a. $y = -2x + 3$

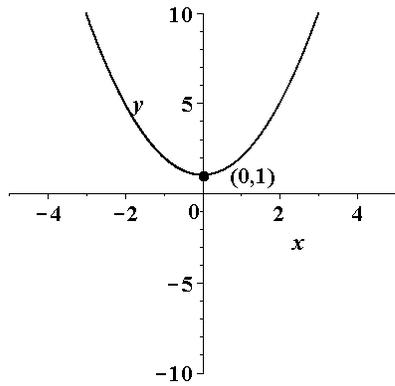b. $y = \sqrt{x} - 4$

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

Chapter 1 Test
Form C

1. Determine the domain and range for each function.

a.

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

b.

(0,1)

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

Chapter 1 Test
Form C

2. Determine which of the following relations indicates that y is <u>NOT</u> 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
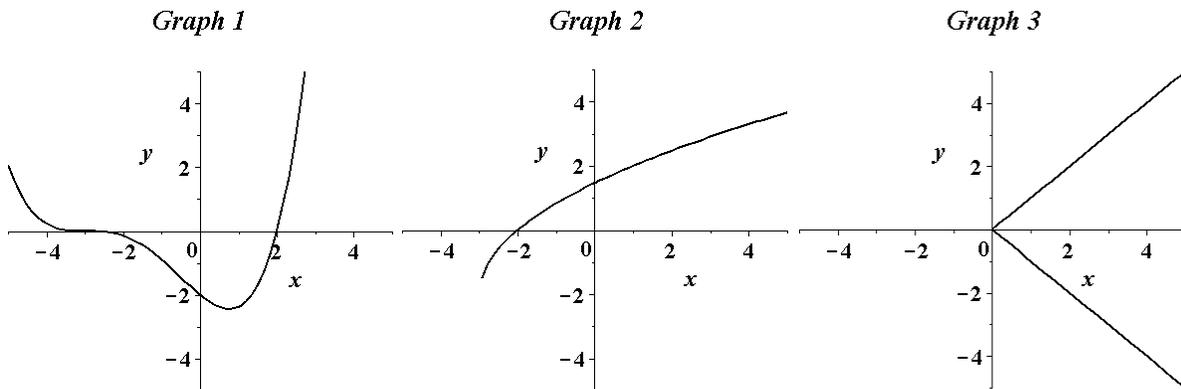   father has 3 brothers.

   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: $y + 8 = 0$

3. Weekly sales of a new book at a book store are given by the function $s(x) = 51x + 32$ books, x weeks after publication.

   a. How many books were sold 5 weeks after publication?

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

   c. Find the rate of change in the number of books sold per week.

Chapter 1 Test
Form C

4. 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. $y = x - 4$

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

 c. $y = x^3 + 6x^2$

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

 a. $y = 8 - 3x$

 b. $2x + 7y = 14$

 c. $y = 6$

6. 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)

7. Write the equation of a line through the point (5, -2) with the given conditions.

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

 b. perpendicular to $y = \dfrac{1}{3}x + 4$

 c. perpendicular to the *x*-axis

8. The table shows the dividends per share of KSBW, Inc. stock from 1990 to 1994.

Year	1990	1991	1992	1993	1994
Dividends (in dollars)	0.30	0.34	0.38	0.42	0.46

a. Find the linear model where x is the number of years after 1990, and y is the dividends in dollars.

b. Use the model to predict the dividends per share of KSBW, Inc. for 2005.

9. The price for a gallon of 2% milk, p (in dollars), over the last six years is given by the function
$$p(x) = 0.0305x^3 - 0.1995x^2 + 0.465x + 2.33$$
where x is the number of years since 2003.

a. What is $p(5)$? (Round your answer to the nearest hundredth.)

b. Approximately, in what year did a gallon of milk cost $2.75? (Use graphing technology to graph the function p(x), and for $0 \le x \le 5$.)

10. The points on the figure below give the number of births per 10,000 23-year-old women as a function of the number of years since 1970.
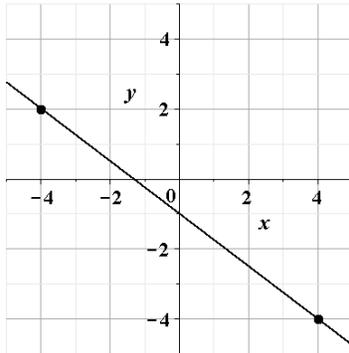
Birth Rate for 23-year-old Women
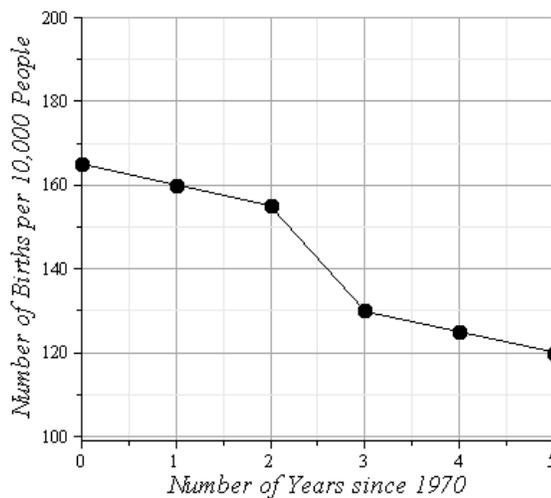
a. What is the domain of the function?

b. Approximately, how many births were there in 1971?

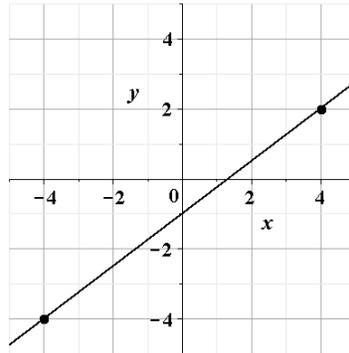c. Approximately, in what year were there 130 births per 10,000 23-year-old-women?

Chapter 1 Test
Form C

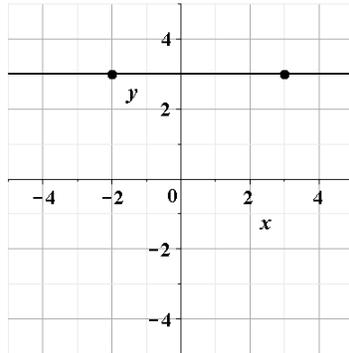11. Write the equation of the line for the following:

a.

b.

c.

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