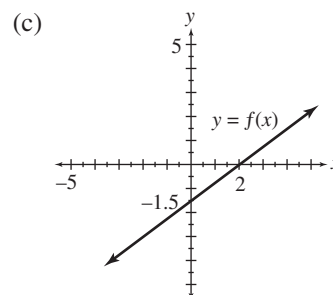
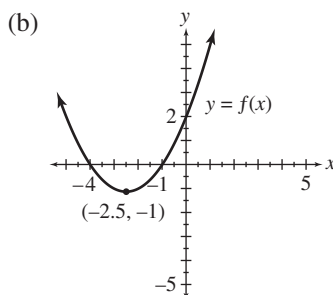
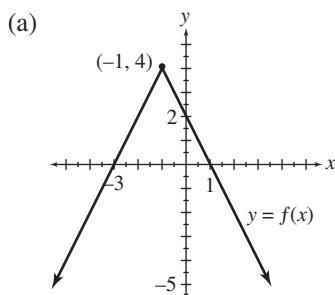


# Chapter 1 Test Form A

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. For each of the functions, determine the (i) domain (ii) range (iii)  $x$ -intercept(s) (iv)  $y$ -intercept(s).



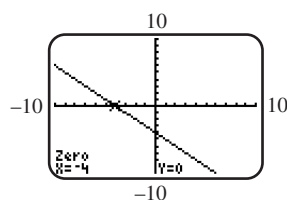
2. Use the screen to solve the equation or inequality. Here the function  $y_1 = f(x)$  is a linear function defined over the domain of real numbers.

(a)  $y_1 = 0$

(b)  $y_1 \leq 0$

(c)  $y_1 \geq 0$

(d)  $y_1 > 0$



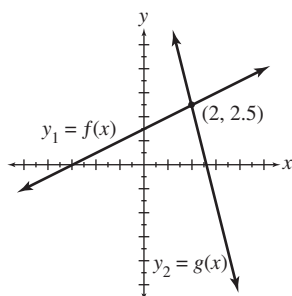
3. Use the figure to solve each equation or inequality.

(a)  $f(x) = g(x)$

(b)  $f(x) < g(x)$

(c)  $f(x) \geq g(x)$

(d)  $y_2 - y_1 = 0$



4. Consider the linear function  $f(x) = \frac{1}{4}(5x - 8) - (x - 3)$ .

(a) Solve the equation  $f(x) = 0$  analytically.

(b) Solve the inequality  $f(x) \leq 0$  analytically.

- (c) Graph  $y = f(x)$  in an appropriate viewing window and explain how the graph supports your answers in parts (a) and (b).

5. Consider the linear functions  $f(x) = \frac{3}{4}(4 - x) + x - 8$  and  $g(x) = 3(x - 3) + 2(x + 2)$ .

(a) Solve  $f(x) = g(x)$  analytically, showing all steps. Also, check analytically.

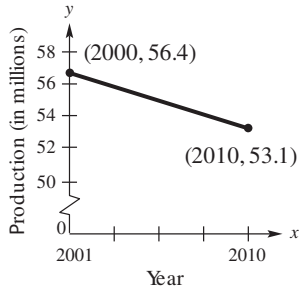
- (b) Graph  $y_1 = f(x)$  and  $y_2 = g(x)$  and use your result in part (a) to find the solution set of  $f(x) < g(x)$ . Explain your answer.

- (c) Repeat part (b) for  $f(x) > g(x)$ .

# Test Form 1-A (continued)

Name: \_\_\_\_\_

6. During the period from 2000 to 2010 the production of a certain item (in millions) decreased in an approximately linear fashion. The graph depicts this decrease using a line segment.



- (a) Use the midpoint formula to estimate the number of items produced in 2005.
- (b) Find the slope of the line and explain the meaning in the context of this situation.
7. Find the equation of the line passing through the point  $(1, -4)$  and
- (a) parallel to the line with equation  $y = 2x + 3$ .
- (b) perpendicular to the line with equation  $3x + y = 0$ .
8. Find the  $x$ - and  $y$ -intercepts of the line whose standard form is  $-3x + 2y = 9$ . What is the slope of this line?
9. Give the equations of both the horizontal and vertical lines passing through the point  $(-2, 12)$ .
10. The table lists number of hours of sleep the night five students had before a final exam and their corresponding scores on the final exam.

Hours of sleep	3	8	11	9	0
Final Exam Score	53	79	90	92	58

- (a) Find the least-squares regression line for the data. Give the correlation coefficient.
- (b) Use the regression line to predict the score for a student who got 6 hours of sleep.
11. Suppose that an empty circular wading pool has a radius of 7 feet. During a storm, rain falling at a rate of 1 inch per hour begins to fill the pool. A small drain at the bottom of the pool is capable of draining 35 gallons of water per hour.
- (a) Determine the number of cubic inches of water falling into the pool in one hour. (*Hint: Each hour a layer of water 1 inch thick falls into the pool.*)
- (b) One gallon of water equals about 231 cubic inches. Write a formula for a function  $g$  that computes the gallons of water landing in the pool in  $x$  hours.
- (c) How many gallons of water land in the pool during a 3 hour storm?
- (d) Will the drain be able to keep up with the rainfall? If not, how many such drains would be needed?

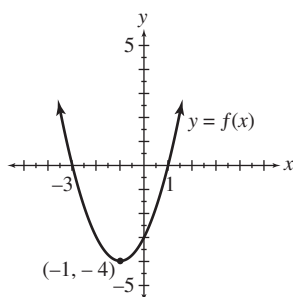
# Chapter 1 Test Form B

Name: \_\_\_\_\_

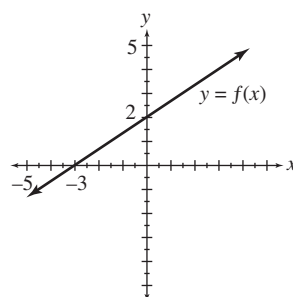
Date: \_\_\_\_\_

1. For each of the functions, determine the (i) domain (ii) range (iii)  $x$ -intercept(s) (iv)  $y$ -intercept(s).

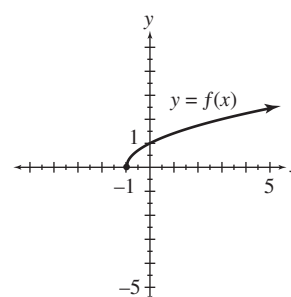
(a)



(b)



(c)



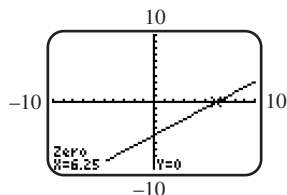
2. Use the screen to solve the equation or inequality. Here the function  $y_1 = f(x)$  is a linear function defined over the domain of real numbers.

(a)  $y_1 = 0$

(b)  $y_1 < 0$

(c)  $y_1 > 0$

(d)  $y_1 \leq 0$



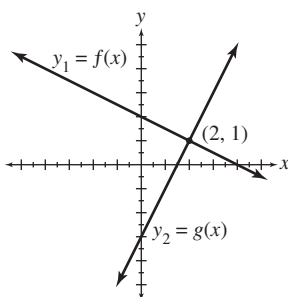
3. Use the figure to solve each equation or inequality.

(a)  $f(x) = g(x)$

(b)  $f(x) < g(x)$

(c)  $f(x) \geq g(x)$

(d)  $y_2 - y_1 = 0$



4. Consider the linear function  $f(x) = 3(x - 1) - \frac{1}{3}(6x - 9)$ .

(a) Solve the equation  $f(x) = 0$  analytically.

(b) Solve the inequality  $f(x) \leq 0$  analytically.

(c) Graph  $y = f(x)$  in an appropriate viewing window and explain how the graph supports your answers in parts (a) and (b).

5. Consider the linear functions  $f(x) = 4 - 3x + 4(x + 1)$  and  $g(x) = 3(x + 1) - 5(x + 2)$ .

(a) Solve  $f(x) = g(x)$  analytically, showing all steps. Also, check analytically.

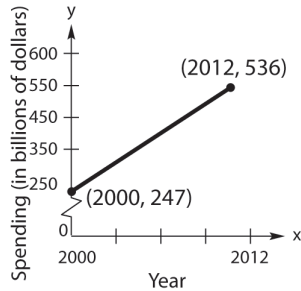
(b) Graph  $y_1 = f(x)$  and  $y_2 = g(x)$  and use your result in part (a) to find the solution set of  $f(x) < g(x)$ . Explain your answer.

(c) Repeat part (b) for  $f(x) > g(x)$ .

# Test Form 1-B (continued)

Name: \_\_\_\_\_

6. During the period from 2000 to 2012, it was estimated that the spending on Medicare (in billions of dollars) would increase in an approximately linear fashion. The graph depicts this increase using a line segment.



- (a) Use the midpoint formula to estimate the spending in 2006.
- (b) Find the slope of the line and explain the meaning in the context of this situation.
7. Find the equation of the line passing through the point  $(2, -1)$  and
- (a) parallel to the line with equation  $y = \frac{1}{2}x + 3$ .
- (b) perpendicular to the line with equation  $-3x - y = 4$ .
8. Find the  $x$ - and  $y$ -intercepts of the line whose standard form is  $3x + 7y = -9$ .  
What is the slope of this line?
9. Give the equations of both the horizontal and vertical lines passing through the point  $(7, 3)$ .
10. The table lists the average cost (in dollars) of tuition and fees at public four-year colleges for selected years.  
(Source: The College Board)

Year	2008	2009	2010	2011	2012
Dollars	7800	7995	8320	8575	8660

- (a) Find the least-squares regression line for the data. Give the correlation coefficient.
- (b) Use the regression line to predict the cost of a public four year university in 2015.
11. Suppose that an empty circular wading pool has a radius of 5 feet. During a storm, rain falling at a rate of 1.5 inches per hour begins to fill the pool. A small drain at the bottom of the pool is capable of draining 30 gallons of water per hour.
- (a) Determine the number of cubic inches of water falling into the pool in one hour. (*Hint:* Each hour a layer of water 1.5 inches thick falls into the pool.)
- (b) One gallon of water equals about 231 cubic inches. Write a formula for a function  $g$  that computes the gallons of water landing in the pool in  $x$  hours.
- (c) How many gallons of water land in the pool during a 2.5 hour storm?
- (d) Will the drain be able to keep up with the rainfall? If not, how many such drains would be needed?

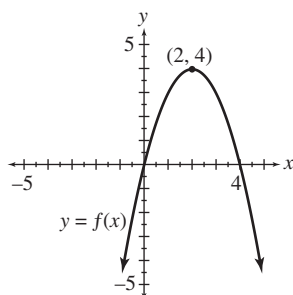
# Chapter 1 Test Form C

Name: \_\_\_\_\_

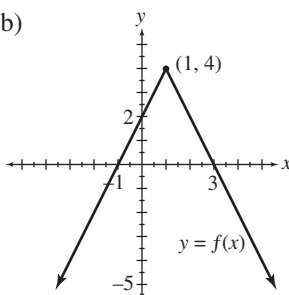
Date: \_\_\_\_\_

1. For each of the functions, determine the (i) domain (ii) range (iii)  $x$ -intercept(s) (iv)  $y$ -intercept(s).

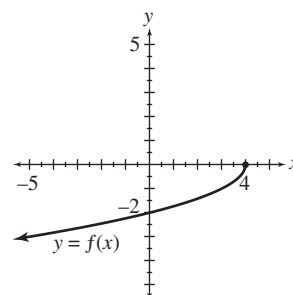
(a)



(b)



(c)



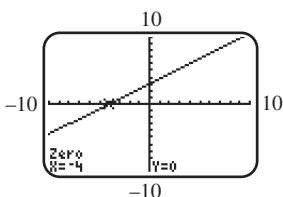
2. Use the screen to solve the equation or inequality. Here the function  $y_1 = f(x)$  is a linear function defined over the domain of real numbers.

(a)  $y_1 = 0$

(b)  $y_1 < 0$

(c)  $y_1 > 0$

(d)  $y_1 \leq 0$



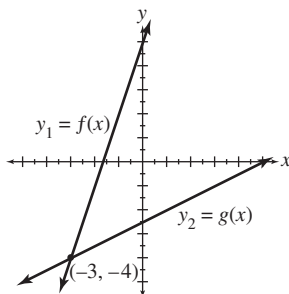
3. Use the figure to solve each equation or inequality.

(a)  $f(x) = g(x)$

(b)  $f(x) < g(x)$

(c)  $f(x) \geq g(x)$

(d)  $y_2 - y_1 = 0$



4. Consider the linear function  $f(x) = 5(x + 4) - (2x + 5)$ .

(a) Solve the equation  $f(x) = 0$  analytically.

(b) Solve the inequality  $f(x) \leq 0$  analytically.

(c) Graph  $y = f(x)$  in an appropriate viewing window and explain how the graph supports your answers in parts (a) and (b).

5. Consider the linear functions  $f(x) = 2(x - 1) + 7$  and  $g(x) = x + 3 - 3(x - 2)$ .

(a) Solve  $f(x) = g(x)$  analytically, showing all steps. Also, check analytically.

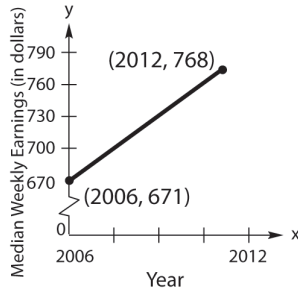
(b) Graph  $y_1 = f(x)$  and  $y_2 = g(x)$  and use your result in part (a) to find the solution set of  $f(x) < g(x)$ . Explain your answer.

(c) Repeat part (b) for  $f(x) > g(x)$ .

# Test Form 1-C (continued)

Name: \_\_\_\_\_

6. During the period from 2006 to 2012, it was estimated that the median weekly earnings of full time hourly wage and salary workers would increase in an approximately linear fashion. The graph depicts this increase using a line segment.



- (a) Use the midpoint formula to estimate the spending in 2009.
- (b) Find the slope of the line and explain the meaning in the context of this situation.
7. Find the  $x$ - and  $y$ -intercepts of the line whose standard form is  $-2x + 5y = -4$ .  
What is the slope of this line?
8. Find the equation of the line passing through the point  $(2, 3)$  and
- (a) parallel to the line with equation  $2x + 3y = 4$ .
- (b) perpendicular to the line with equation  $y = \frac{1}{4}x + 2$ .
9. Give the equations of both the vertical and horizontal lines passing through the point  $(-2, 5)$
10. The table lists the period of revolution (in days) of each planet and the mean distance of the sun (in millions of miles) from each planet.

<i>Planet</i>	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
<i>Distance from Sun</i>	36	67	93	142	484	887	1784	2796	3666
<i>Period of Revolution</i>	88	225	365	687	4329	10,753	30,660	60,225	90,520

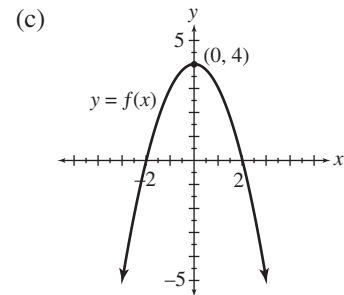
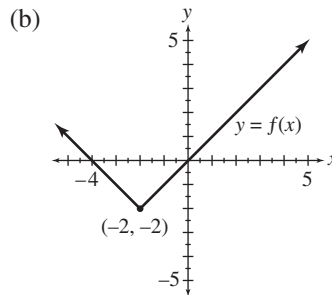
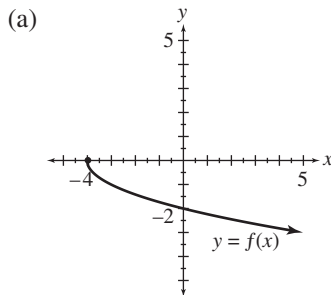
- (a) Find the least-squares regression line for the data. Give the correlation coefficient.
- (b) Use this line to predict the period of revolution of an asteroid that has a mean distance of 260 million miles from the sun.
11. Suppose that an empty circular wading pool has a radius of 9 feet. During a storm, rain falling at a rate of 0.5 inch per hour begins to fill the pool. A small drain at the bottom of the pool is capable of draining 20 gallons of water per hour.
- (a) Determine the number of cubic inches of water falling into the pool in one hour. (*Hint:* Each hour a layer of water 0.5 inch thick falls into the pool.)
- (b) One gallon of water equals about 231 cubic inches. Write a formula for a function  $g$  that computes the gallons of water landing in the pool in  $x$  hours.
- (c) How many gallons of water land in the pool during a 2.5 hour storm?
- (d) Will the drain be able to keep up with the rainfall? If not, how many such drains would be needed?

# Chapter 1 Test Form D

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. For each of the functions, determine the (i) domain (ii) range (iii)  $x$ -intercept(s) (iv)  $y$ -intercept(s).



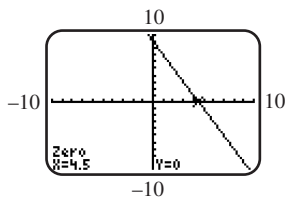
2. Use the screen to solve the equation or inequality. Here the function  $y_1 = f(x)$  is a linear function defined over the domain of real numbers.

(a)  $y_1 = 0$

(b)  $y_1 < 0$

(c)  $y_1 > 0$

(d)  $y_1 \leq 0$



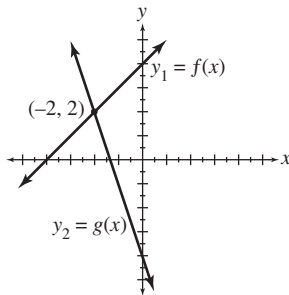
3. Use the figure to solve each equation or inequality.

(a)  $f(x) = g(x)$

(b)  $f(x) < g(x)$

(c)  $f(x) \geq g(x)$

(d)  $y_2 - y_1 = 0$



4. Consider the linear function  $f(x) = 2(x - 3) - \frac{1}{2}(6x + 2)$ .

(a) Solve the equation  $f(x) = 0$  analytically.

(b) Solve the inequality  $f(x) \leq 0$  analytically.

- (c) Graph  $y = f(x)$  in an appropriate viewing window and explain how the graph supports your answers in parts (a) and (b).

5. Consider the linear functions  $f(x) = -3(x + 1) + 2x + 1$  and  $g(x) = 2x - 2(3x + 10)$ .

(a) Solve  $f(x) = g(x)$  analytically, showing all steps. Also, check analytically.

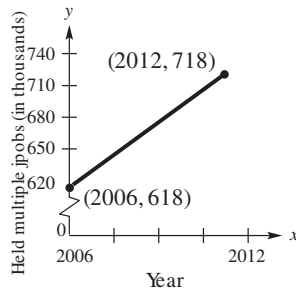
- (b) Graph  $y_1 = f(x)$  and  $y_2 = g(x)$  and use your result in part (a) to find the solution set of  $f(x) < g(x)$ . Explain your answer.

- (c) Repeat part (b) for  $f(x) > g(x)$ .

# Test Form 1-D (continued)

Name: \_\_\_\_\_

6. During the period from 2006 to 2012, it was estimated that the number of men (in thousands) age 55 years and older that held multiple jobs increased in an approximately linear fashion. The graph depicts this increase using a line segment. (Source: U.S. Department of Labor Statistics)



- (a) Use the midpoint formula to estimate the spending in 2009.
- (b) Find the slope of the line and explain the meaning in the context of this situation.
7. Find the equation of the line passing through the point  $(-4, 0)$  and
- (a) parallel to the line with equation  $y = 3x + 7$ .
- (b) perpendicular to the line with equation  $\frac{1}{3}x - y = 5$ .
8. Find the  $x$ - and  $y$ -intercepts of the line whose standard form is  $3x - y = 5$ .  
What is the slope of this line?
9. Give the equations of both the horizontal and vertical lines passing through the point  $(4, -7)$ .
10. The table lists the average cost (in dollars) of tuition and fees at a private four year university for selected years (Source: The College Board)

Year	2008	2009	2010	2011	2012
Dollars	27,802	27,874	28,025	28,358	29,056

- (a) Find the least squares regression line for the given data. Give the correlation coefficient.
- (b) Use the regression line to predict the cost of a private four year university in 2015.
11. Suppose that an empty circular wading pool has a radius of 5 feet. During a storm, rain falling at a rate of 0.6 inch per hour begins to fill the pool. A small drain at the bottom of the pool is capable of draining 35 gallons of water per hour.
- (a) Determine the number of cubic inches of water falling into the pool in one hour. (Hint: Each hour a layer of water 0.6 inch thick falls into the pool.)
- (b) One gallon of water equals about 231 cubic inches. Write a formula for a function  $g$  that computes the gallons of water landing in the pool in  $x$  hours.
- (c) How many gallons of water land in the pool during a 2 hour storm?
- (d) Will the drain be able to keep up with the rainfall? If not, how many such drains would be needed?