

***Graphical Approach to College Algebra 7th edition
Hornsby Test Bank***

SKU: 9780134696522-TEST-BANK

Chapter 2 Test Form A

Name: _____

Date: _____

1. Match the set described in Column I with the correct interval notation from Column II. Choices in Column II may be used once, more than once, or not at all.

Column I

(a) domain of $f(x) = (x-3)^2$

(b) range of $f(x) = (x-3)^2$

(c) domain of $x = y^2 + 3$

(d) range of $x = y^2 + 3$

(e) domain of $f(x) = 3 - \sqrt{x}$

(f) range of $f(x) = \sqrt{3-x}$

(g) domain of $f(x) = \sqrt[3]{x+3}$

(h) range of $f(x) = \sqrt[3]{x-3}$

(i) domain of $f(x) = |x-3|$

(j) range of $f(x) = |x| + 3$

Column II

A. $[3, \infty)$

B. $[0, \infty)$

C. $(3, \infty)$

D. $(-\infty, 0]$

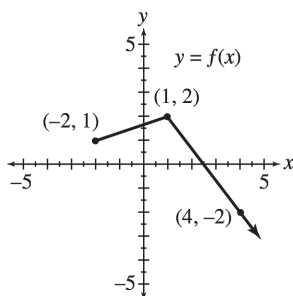
E. $[-3, \infty)$

F. $(-\infty, 3]$

G. $(-\infty, \infty)$

H. $(-\infty, 0)$

2. The graph of $y = f(x)$ is shown here.



Sketch the graph of each of the following. Use ordered pairs to indicate 3 points on the graph.

(a) $y = f(x+3)$

(b) $y = f(x)+3$

(c) $y = f(-x)$

(d) $y = -f(x)$

(e) $y = 3f(x)$

(f) $y = |f(x)|$

3. If the point $(9, 12)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

(a) $f\left(\frac{1}{9}x\right)$

(b) $f(3x)$

4. Graph $y = f(x)$ by hand.

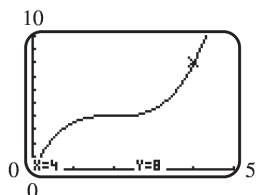
(a) $f(x) = (x-2)^2 + 1$

(b) $f(x) = \frac{1}{2}\sqrt{x-3}$

Test Form 2-A (continued)

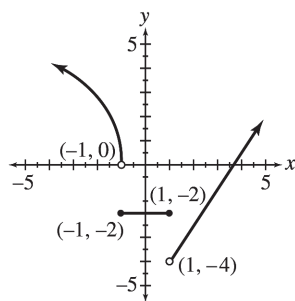
Name: _____

5. Observe the coordinates displayed at the bottom of the given screen showing a portion of the graph $y = f(x)$. Answer each of the following based on your observation.



- If the graph is symmetric with respect to the y -axis, what are the coordinates of another point on the graph?
 - If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
 - Suppose the graph is symmetric with respect to the y -axis. Sketch a typical viewing window with dimensions $[-5, 5]$ by $[0, 10]$. Then draw the graph you would expect to see in this window.
6. (a) Write a description that explains how the graph of $y = 2\sqrt{x-1} + 3$ can be obtained by translating the graph of $y = \sqrt{x}$.
- (b) Sketch by hand the graph of $y = -2|x+2| - 3$. State the domain and the range.

7. Consider the graph of the function shown here.



State the interval(s) over which the function is:

- increasing
 - decreasing
 - constant
 - continuous
- (e) What is the domain of the function? (f) What is the range of this function?
8. Solve each of the following analytically, showing all steps. Next graph $y_1 = |4x + 2|$ and $y_2 = 2$ in the standard viewing window of a graphing calculator. Then state how the graphs support your solution in each case.
- $|4x + 2| = 2$
 - $|4x + 2| < 2$
 - $|4x + 2| > 2$

Test Form 2-A (continued)

Name: _____

9. Give $f(x) = 3x^2 - 2x - 6$ and $g(x) = 3x + 5$, find each of the following. Simplify the expression when possible.
- (a) $(f - g)(x)$ (b) $\frac{f}{g}(x)$ (c) the domain of $\frac{f}{g}$
- (d) $(f \circ g)(x)$ (e) $\frac{f(x+h) - f(x)}{h} (h \neq 0)$
10. Consider the piecewise-defined function defined by $f(x) = \begin{cases} x^2 - 6 & \text{if } x \leq 1 \\ \sqrt{x} & \text{if } x > 1 \end{cases}$.
- (a) Graph f by hand.
- (b) Use a graphing calculator to obtain an accurate graph in the window $[-5, 10]$ by $[-10, 10]$.
11. The price of postage for mail is defined by the function $P(x) = 0.49\lceil x + 1 \rceil$, where x represents the weight of the letter in ounces.
- (a) Using dot mode and the window $[0, 5]$ by $[0, 4]$, graph this function on a graphing calculator.
- (b) Use the graph to find the price of a 2.42 ounce envelope.
12. The members of the New Jazz band want to record a new CD. The cost to record a CD is \$4000 for studio fees plus \$1.50 for each CD produced.
- (a) Write a cost function C , where x represents the number of CD's produced.
- (b) Find the revenue function R , if each CD in part (a) sells for \$12.
- (c) Write the profit function.
- (d) How many CD's must be produced and sold before the band earns a profit?
- (e) Support the results of part (d) graphically.

Chapter 2 Test Form B

Name: _____

Date: _____

1. Match the set described in Column I with the correct interval notation from Column II. Choices in Column II may be used once, more than once, or not at all.

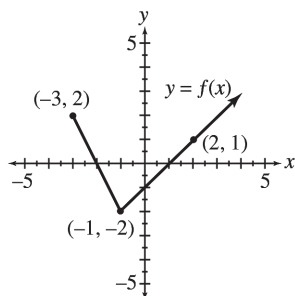
Column I

- (a) domain of $f(x) = x^2 - 5$
- (b) range of $f(x) = x^2 - 5$
- (c) domain of $f(x) = \sqrt{x} + 5$
- (d) range of $f(x) = \sqrt{x - 5}$
- (e) domain of $f(x) = |x| - 5$
- (f) range of $f(x) = |x + 5|$
- (g) domain of $f(x) = \sqrt[3]{x - 5}$
- (h) range of $f(x) = \sqrt[3]{x + 5}$
- (i) domain of $x = y^2 - 5$
- (j) range of $x = y^2 - 5$

Column II

- A. $(-\infty, \infty)$
- B. $[0, \infty)$
- C. $(-\infty, 0]$
- D. $[-5, \infty)$
- E. $(5, \infty)$
- F. $(-5, \infty)$
- G. $(-\infty, 5]$
- H. $[5, \infty)$

2. The graph of $y = f(x)$ is shown here.



Sketch the graph of each of the following. Use ordered pairs to indicate 3 points on the graph.

- (a) $y = f(x) - 3$
- (b) $y = f(x - 3)$
- (c) $y = -f(x)$
- (d) $y = f(-x)$
- (e) $y = 3f(x)$
- (f) $y = |f(x)|$

3. If the point $(15, 8)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

- (a) $f(x + 2)$
- (b) $f(x) + 3$

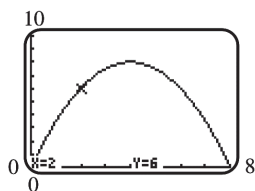
4. Graph $y = f(x)$ by hand.

- (a) $f(x) = |x - 3| + 4$
- (b) $f(x) = 2\sqrt{4 - x}$

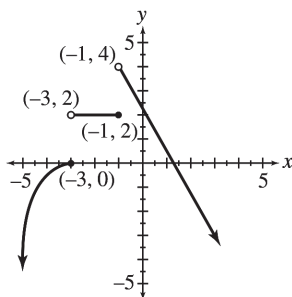
Test Form 2-B (continued)

Name: _____

5. Observe the coordinates displayed at the bottom of the given screen showing a portion of the graph $y = f(x)$. Answer each of the following based on your observation.



- If the graph is symmetric with respect to the y -axis, what are the coordinates of another point on the graph?
 - If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
 - Suppose the graph is symmetric with respect to the y -axis. Sketch a typical viewing window with dimensions $[-8, 8]$ by $[0, 10]$. Then draw the graph you would expect to see in this window.
6. (a) Write a description that explains how the graph of $y = \sqrt[3]{x+5}$ can be obtained by translating the graph of $y = \sqrt[3]{x}$.
- (b) Sketch by hand the graph of $y = -|x-2|+3$. State the domain and the range.
7. Consider the graph of the function shown here.



State the interval(s) over which the function is:

- increasing
 - decreasing
 - constant
 - continuous
- (e) What is the domain of the function? (f) What is the range of this function?
8. Solve each of the following analytically, showing all steps. Next graph $y_1 = |2x-1|$ and $y_2 = 5$ in the standard viewing window of a graphing calculator. Then state how the graphs support your solution in each case.
- $|2x-1| = 5$
 - $|2x-1| < 5$
 - $|2x-1| > 5$

Test Form 2-B (continued)

Name: _____

9. Give $f(x) = 2x^2 + 5x - 3$ and $g(x) = 2x + 1$, find each of the following. Simplify the expression when possible.

(a) $(f - g)(x)$ (b) $\frac{f}{g}(x)$ (c) the domain of $\frac{f}{g}$

(d) $(f \circ g)(x)$ (e) $\frac{f(x+h) - f(x)}{h} (h \neq 0)$

10. Consider the piecewise-defined function defined by $f(x) = \begin{cases} x^2 - 7 & \text{if } x \leq 1 \\ -\sqrt{x} + 5 & \text{if } x > 1 \end{cases}$.

- (a) Graph f by hand.
- (b) Use a graphing calculator to obtain an accurate graph in the window $[-5, 10]$ by $[-10, 10]$.

11. A local tree service company has been hired to clear an area of trees. If x represents the number of hours they will work, where $x > 0$, then the function $P(x) = 120\llbracket x \rrbracket + 435$ gives the total cost in dollars.

- (a) Using dot mode and the window $[0, 10]$ by $[0, 3000]$, graph this function on a graphing calculator.
- (b) Use the graph to find the price of an 8.25 hour day.

12. Two friends open a new coffee shop. Their initial cost is \$22,000. A dozen doughnuts costs \$0.45 to make.

- (a) Write a cost function C , where x represents the number of dozen of doughnuts made.
- (b) Find the revenue function R , if each dozen in part (a) sells for \$10.
- (c) Write the profit function.
- (d) How many dozen doughnuts must be produced and sold before the men earn a profit?
- (e) Support the results of part (d) graphically.

Chapter 2 Test Form C

Name: _____

Date: _____

1. Match the set described in Column I with the correct interval notation from Column II. Choices in Column II may be used once, more than once, or not at all.

Column I

(a) domain of $f(x) = \sqrt{x} - 2$

(b) range of $f(x) = \sqrt{x+2}$

(c) domain of $f(x) = |x-2|$

(d) range of $f(x) = |x| + 2$

(e) domain of $f(x) = x^2 + 2$

(f) range of $f(x) = x^2 + 2$

(g) domain of $f(x) = \sqrt[3]{x+2}$

(h) range of $f(x) = \sqrt[3]{x} - 2$

(i) domain of $x = y^2 + 2$

(j) range of $x = y^2 + 2$

Column II

A. $(-\infty, 0)$

B. $(-\infty, \infty)$

C. $(-\infty, 2]$

D. $[-2, \infty)$

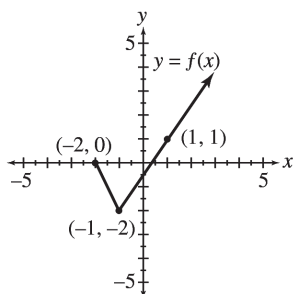
E. $(-\infty, 0]$

F. $(2, \infty)$

G. $[0, \infty)$

H. $[2, \infty)$

2. The graph of $y = f(x)$ is shown here.



Sketch the graph of each of the following. Use ordered pairs to indicate 3 points on the graph.

(a) $y = f(x+2)$

(b) $y = f(x) + 2$

(c) $y = f(-x)$

(d) $y = -f(x)$

(e) $y = 2f(x)$

(f) $y = |f(x)|$

3. If the point $(-3, 4)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

(a) $f(x+1) + 2$

(b) $f(3x) - 1$

4. Graph $y = f(x)$ by hand.

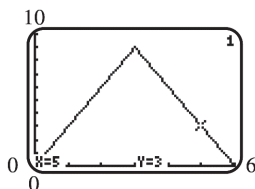
(a) $f(x) = (x-1)^3 + 5$

(b) $f(x) = -2\sqrt{2-x}$

Test Form 2-C (continued)

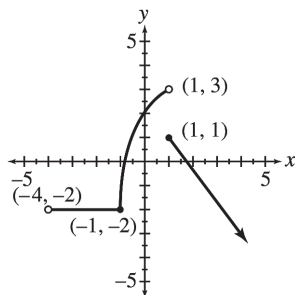
Name: _____

5. Observe the coordinates displayed at the bottom of the given screen showing a portion of the graph $y = f(x)$. Answer each of the following based on your observation.



- If the graph is symmetric with respect to the y -axis, what are the coordinates of another point on the graph?
 - If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
 - Suppose the graph is symmetric with respect to the y -axis. Sketch a typical viewing window with dimensions $[-6, 6]$ by $[0, 10]$. Then draw the graph you would expect to see in this window.
6. (a) Write a description that explains how the graph of $y = \frac{1}{2}\sqrt[3]{x+3}$ can be obtained by translating the graph of $y = \sqrt[3]{x}$.
- (b) Sketch by hand the graph of $y = -3|x-6| + 4$. State the domain and the range.

7. Consider the graph of the function shown here.



State the interval(s) over which the function is:

- increasing
 - decreasing
 - constant
 - continuous
 - What is the domain of the function?
 - What is the range of this function?
8. Solve each of the following analytically, showing all steps. Next graph $y_1 = |3x-6|$ and $y_2 = 3$ in the standard viewing window of a graphing calculator. Then state how the graphs support your solution in each case.
- $|3x-6| = 3$
 - $|3x-6| < 3$
 - $|3x-6| > 3$

Test Form 2-C (continued)

Name: _____

9. Give $f(x) = 4x^2 - 3x + 2$ and $g(x) = 3x + 2$, find each of the following. Simplify the expression when possible.
- (a) $(f - g)(x)$ (b) $\frac{f}{g}(x)$ (c) the domain of $\frac{f}{g}$
- (d) $(f \circ g)(x)$ (e) $\frac{f(x+h) - f(x)}{h} (h \neq 0)$
10. Consider the piecewise-defined function defined by $f(x) = \begin{cases} 4\sqrt{-x} + 2 & \text{if } x < -4 \\ 0.5x^2 - 6 & \text{if } x \geq -4 \end{cases}$.
- (a) Graph f by hand.
- (b) Use a graphing calculator to obtain an accurate graph in the window $[-15, 10]$ by $[-10, 20]$.
11. The PayMore car rental company is a sports car rental agency. If x represents the number of days you rent the car, where $x > 0$, then the function $P(x) = 225\lceil x + 1 \rceil + 400$ gives the total cost in dollars.
- (a) Using dot mode and the window $[0, 10]$ by $[0, 3700]$, graph this function on a graphing calculator.
- (b) Use the graph to find the price of 2.75 days.
12. The class of 2018 wants to raise money for a class trip by selling mini-doughnuts. Their initial cost is \$500 to rent the equipment. A bag of doughnuts costs \$0.40 to make.
- (a) Write a cost function C , where x represents the number of bags of doughnuts made.
- (b) Find the revenue function R , if each dozen in part (a) sells for \$5.
- (c) Write the profit function.
- (d) How many bags of doughnuts must be produced and sold before the class earns a profit?
- (e) Support the results of part (d) graphically.

Chapter 2 Test Form D

Name: _____

Date: _____

1. Match the set described in Column I with the correct interval notation from Column II. Choices in Column II may be used once, more than once, or not at all.

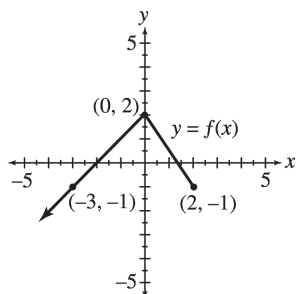
Column I

- (a) domain of $f(x) = x^2 + 9$
- (b) range of $f(x) = x^2 + 9$
- (c) domain of $f(x) = \sqrt{x} - 9$
- (d) range of $f(x) = \sqrt{x + 9}$
- (e) domain of $f(x) = |x - 9|$
- (f) range of $f(x) = |x| + 9$
- (g) domain of $f(x) = \sqrt[3]{x + 9}$
- (h) range of $f(x) = \sqrt[3]{x} - 9$
- (i) domain of $x = y^2 + 9$
- (j) range of $x = y^2 + 9$

Column II

- A. $[0, \infty)$
- B. $[9, \infty)$
- C. $(-\infty, 9]$
- D. $(-9, \infty)$
- E. $(-\infty, \infty)$
- F. $(9, \infty)$
- G. $(-\infty, 0]$
- H. $[-9, \infty)$

2. The graph of $y = f(x)$ is shown here.



Sketch the graph of each of the following. Use ordered pairs to indicate 3 points on the graph.

- (a) $y = f(x - 2)$
- (b) $y = f(x) - 2$
- (c) $y = -f(x)$
- (d) $y = f(-x)$
- (e) $y = 2f(x)$
- (f) $y = |f(x)|$

3. If the point $(-2, -1)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

- (a) $f(x - 3) + 1$
- (b) $f(x) - 10$

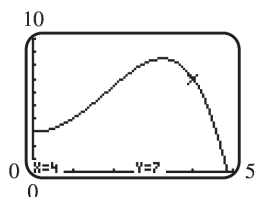
4. Graph $y = f(x)$ by hand.

- (a) $f(x) = -|x - 2| - 4$
- (b) $f(x) = \sqrt{x - 1} + 2$

Test Form 2-D (continued)

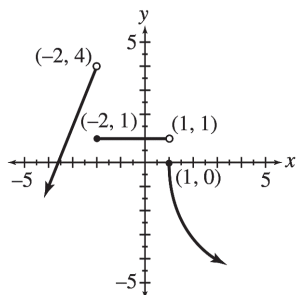
Name: _____

5. Observe the coordinates displayed at the bottom of the given screen showing a portion of the graph $y = f(x)$. Answer each of the following based on your observation.



- If the graph is symmetric with respect to the y -axis, what are the coordinates of another point on the graph?
 - If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
 - Suppose the graph is symmetric with respect to the y -axis. Sketch a typical viewing window with dimensions $[-5, 5]$ by $[0, 10]$. Then draw the graph you would expect to see in this window.
6. (a) Write a description that explains how the graph of $y = \sqrt[3]{x-4} + 5$ can be obtained by translating the graph of $y = \sqrt[3]{x}$.
- (b) Sketch by hand the graph of $y = \frac{1}{2}|x-4| + 3$. State the domain and the range.

7. Consider the graph of the function shown here.



State the interval(s) over which the function is:

- increasing
 - decreasing
 - constant
 - continuous
 - What is the domain of the function?
 - What is the range of this function?
8. Solve each of the following analytically, showing all steps. Next graph $y_1 = |2x + 3|$ and $y_2 = 3$ in the standard viewing window of a graphing calculator. Then state how the graphs support your solution in each case.
- $|2x + 3| = 3$
 - $|2x + 3| < 3$
 - $|2x + 3| > 3$

Test Form 2-D (continued)

Name: _____

9. Give $f(x) = -2x^2 + 2x - 1$ and $g(x) = 2x - 3$, find each of the following. Simplify the expression when possible.

(a) $(f - g)(x)$ (b) $\frac{f}{g}(x)$ (c) the domain of $\frac{f}{g}$

(d) $(f \circ g)(x)$ (e) $\frac{f(x+h) - f(x)}{h} (h \neq 0)$

10. Consider the piecewise-defined function defined by $f(x) = \begin{cases} x^2 - 8 & \text{if } x < 4 \\ -\sqrt{x} - 4 & \text{if } x \geq 4 \end{cases}$.

- (a) Graph f by hand.
- (b) Use a graphing calculator to obtain an accurate graph in the window $[-5, 15]$ by $[-10, 5]$.

11. The local printing company produces wedding invitations. If x represents the number of invitations, where $x > 0$, then the function $C(x) = 55 \left\lceil \frac{x}{38} \right\rceil + 75$ gives the total cost in dollars.

- (a) Using dot mode and the window $[0, 250]$ by $[0, 500]$, graph this function on a graphing calculator.
- (b) Use the graph to find the total cost of 150 invitations.

12. The class of 2018 wants to raise money for a class trip by printing and selling silk screen t-shirts. Their initial cost is \$100 to rent the silk screen machine. Each t-shirt costs \$2.75 to make.

- (a) Write a cost function C , where x represents the number of t-shirts produced.
- (b) Find the revenue function R , if each t-shirt in part (a) sells for \$20.
- (c) Write the profit function.
- (d) How many t-shirts must be produced and sold before the class earns a profit?
- (e) Support the results of part (d) graphically.