

Name: _____

Date: _____

Chapter 2 Test Form A

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.

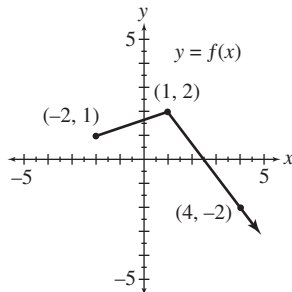
Column I

- (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) $ |

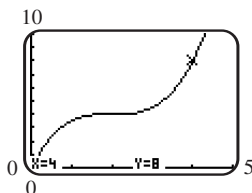
3. If the point $(2, 7)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

- | | |
|--------------------------------------|-----------------|
| (a) $y = f\left(\frac{1}{2}x\right)$ | (b) $y = f(4x)$ |
|--------------------------------------|-----------------|

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

- | | |
|----------------------------|----------------------------|
| (a) $f(x) = (x - 1)^3 + 2$ | (b) $f(x) = 2\sqrt{x - 3}$ |
|----------------------------|----------------------------|

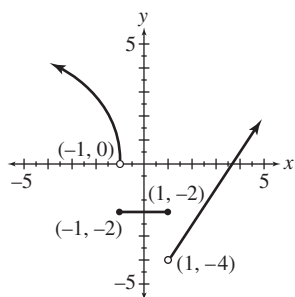
5. Observe the coordinates displayed at the bottom of the given screen showing a portion of the graph $y = f(x)$. Answer each of the following based on your observation.



Test Form 2-A (continued)

Name: _____

- (a) If the graph is symmetric with respect to the y-axis, what are the coordinates of another point on the graph?
 - (b) If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
 - (c) 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:

- (a) increasing (b) decreasing (c) constant (d) 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.
- (a) $|4x + 2| = 2$ (b) $|4x + 2| < 2$ (c) $|4x + 2| > 2$
9. Given $f(x) = 3x^2 - 2x - 6$ 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. In Fairfield you can go to a coffee shop and pay to use their Internet service. If x represents the number of minutes you are online, where $x > 0$, then the function defined by $f(x) = .50\lceil x \rceil + 1.50$ gives the total cost in dollars.
- (a) Using dot mode and the window $[0, 15]$ by $[0, 10]$, graph this function on a graphing calculator.
 - (b) Use the graph to find the cost of being online for 6.5 minutes.

Test Form 2-A *(continued)*

Name: _____

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12. Craig Mallery's band wants to record a CD. The cost to record a CD is \$750 for studio fees plus \$4.50 for each CD produced.
- (a) Write a cost function C , where x represents the number of CDs produced.
 - (b) Find the revenue function R , if each CD in part (a) sells for \$12.00.
 - (c) Give the profit function P .
 - (d) How many CDs 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: _____

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.

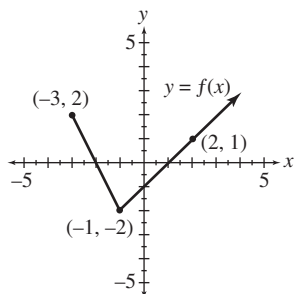
Column I

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

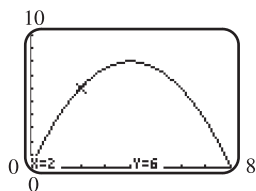
3. If the point $(4, 2)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

- (a) $y = f(x - 3)$
- (b) $y = f(x) - 3$

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

- (a) $f(x) = |x + 2| - 1$
- (b) $f(x) = \sqrt[3]{-x}$

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.



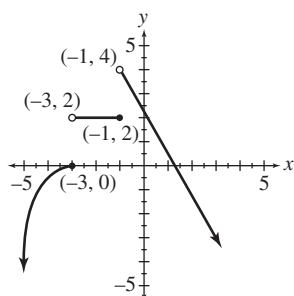
- (a) If the graph is symmetric with respect to the y-axis, what are the coordinates of another point on the graph?

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Test Form 2-B (continued)

- (b) If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
- (c) 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:

- (a) increasing (b) decreasing (c) constant (d) 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.
- (a) $|2x - 1| = 5$ (b) $|2x - 1| < 5$ (c) $|2x - 1| > 5$
9. Given $f(x) = 2x^2 + 5x - 3$ 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. Royal Tree Service 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 defined by $f(x) = 125\lfloor x \rfloor + 250$ gives the total cost in dollars.
- (a) Using dot mode and the window $[0, 10]$ by $[0, 1500]$, graph this function on a graphing calculator.
- (b) Use the graph to find the cost of a 7.5 hour workday.

Test Form 2-B *(continued)*

Name: _____

12. Martin Boggs opens a new fruit juice shop that specializes in frozen blended juice drinks called “smoothies.” His initial cost is \$5075. Each smoothie costs \$2.00 to make.
- (a) Write a cost function C , where x represents the number of smoothies made.
 - (b) Find the revenue function R , if each smoothie in part (a) sells for \$3.75.
 - (c) Give the profit function P .
 - (d) How many smoothies must be made and sold before Martin earns 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.

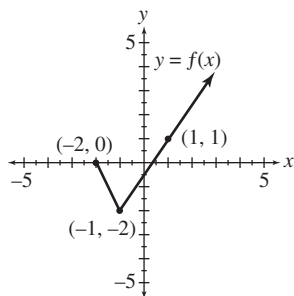
Column I

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

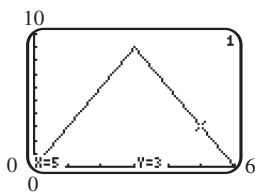
3. If the point $(-1, -2)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

- (a) $y = -f(x)$
- (b) $y = f(-x)$

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

- (a) $f(x) = -(x + 1)^2 + 2$
- (b) $f(x) = (x - 3)^2 - 3$

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.



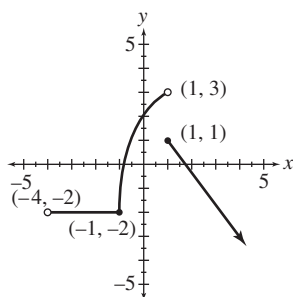
- (a) If the graph is symmetric with respect to the y-axis, what are the coordinates of another point on the graph?

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Test Form 2-C (continued)

- (b) If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
- (c) 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 $f(x) = \frac{1}{2}\sqrt[3]{x+3}$ 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:

- (a) increasing (b) decreasing (c) constant (d) 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 $y_1 = |3x - 6|$ and $y_2 = 3$ in the standard viewing window of a graphing calculator. Then state how the graphs support your solution in each case.
- (a) $|3x - 6| = 3$ (b) $|3x - 6| < 3$ (c) $|3x - 6| > 3$
9. Given $f(x) = 4x^2 - 3x + 2$ 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 $f(x) = \begin{cases} 4\sqrt{-x+2} & \text{if } x < -4 \\ .5x^2 - 6 & \text{if } x \geq -4 \end{cases}$.
- (a) Graph f by hand.
- (b) Use a graphing calculator to obtain an accurate graph in the window $[-15, 10]$ by $[-10, 20]$.
11. Rent and Go car rental serves the greater Sacramento area. If x represents the number of days you rent a car, where $x > 0$, then the function defined by $f(x) = 30\lfloor x \rfloor + 10$ gives the total cost of a car rental in dollars.
- (a) Using dot mode and the window $[0, 6]$ by $[0, 200]$, graph this function on a graphing calculator.
- (b) Use the graph to find the cost of renting a car for 5 days.

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Test Form 2-C (*continued*)

12. The Class of 2010 wants to raise money for a class trip by selling hot pretzels in school. The initial cost is \$160 to rent the oven. Each pretzel costs \$.75 to make.
- (a) Write a cost function C , where x represents the number of pretzels made.
 - (b) Find the revenue function R , if each pretzel in part (a) sells for \$2.00.
 - (c) Give the profit function P .
 - (d) How many pretzels must be made and sold before the class earns a profit?
 - (e) Support the results of part (d) graphically.

Chapter 2 Test Form D

Name: _____

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.

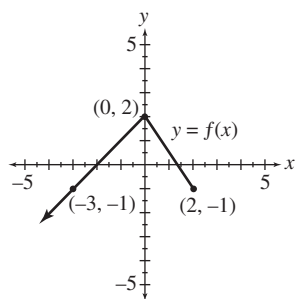
Column I

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

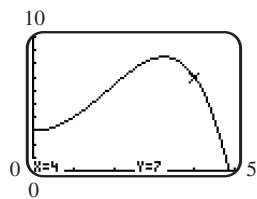
3. If the point $(4, 3)$ lies on the graph of $y = f(x)$, determine a point on the graph of each equation.

- (a) $y = 2f(x)$
- (b) $y = f(2x) - 1$

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

- (a) $f(x) = \sqrt[3]{x} + 1$
- (b) $f(x) = |-2x|$

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.



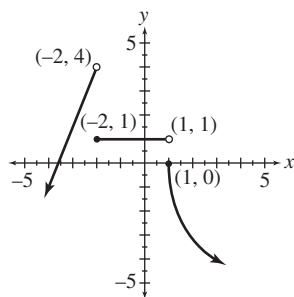
- (a) If the graph is symmetric with respect to the y-axis, what are the coordinates of another point on the graph?

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Test Form 2-D (*continued*)

- (b) If the graph is symmetric with respect to the origin, what are the coordinates of another point on the graph?
- (c) 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:

- (a) increasing (b) decreasing (c) constant (d) 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 $y_1 = |2x + 3|$ and $y_2 = 3$ in the standard viewing window of a graphing calculator. Then state how the graphs support your solution in each case.
- (a) $|2x + 3| = 3$ (b) $|2x + 3| < 3$ (c) $|2x + 3| > 3$
9. Given $f(x) = -2x^2 + 2x - 1$ 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 $f(x) = \begin{cases} x^2 - 8 & \text{if } x < 4 \\ -2x - 4 & \text{if } x \geq 4 \end{cases}$.
- (a) Graph f by hand.
- (b) Use a graphing calculator to obtain an accurate graph in the window $[-5, 15]$ by $[-10, 5]$.
11. Specialty Printing produces engraved wedding invitations. If x represents the number of invitations, where $x > 0$, then the function defined by $f(x) = 75\left\lceil \frac{x}{25} \right\rceil + 100$ gives the total cost in dollars.
- (a) Using dot mode and the window $[0, 250]$ by $[0, 900]$, graph this function on a graphing calculator.
- (b) Use the graph to find the cost of hiring Specialty Printing to print 120 invitations.

Test Form 2-D (continued)

Name: _____

12. Tiny Toys is going to produce a toy race car version of the new Volkswagen Bug. The overhead for the project is \$378. Each toy Bug costs \$1.25 to make.
- (a) Write a cost function C , where x represents the number of toy Bugs manufactured.
 - (b) Find the revenue function R , if each toy Bug in part (a) sells for \$3.00.
 - (c) Give the profit function P .
 - (d) How many toy Bugs must be produced and sold before Tiny Toys earns a profit?
 - (e) Support the results of part (d) graphically.