

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

1. Based on the following table, find  $f(-3)$ .

|        |    |    |    |   |   |     |      |
|--------|----|----|----|---|---|-----|------|
| $x$    | -3 | -2 | -1 | 0 | 1 | 2   | 3    |
| $f(x)$ | 3  | 3  | 5  | 2 | 1 | 0.5 | 1.55 |

- a. 2
- b. 1.55
- c. 3
- d. 1
- e. 0.5

**ANSWER:** c

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 10/17/2016 3:53 AM

2. Based on the following table, find  $f(2) - f(0)$ .

|        |    |    |    |   |   |     |     |
|--------|----|----|----|---|---|-----|-----|
| $x$    | -3 | -2 | -1 | 0 | 1 | 2   | 3   |
| $f(x)$ | 5  | 6  | 6  | 3 | 2 | 1.5 | 1.6 |

- a. -1.5
- b. 3
- c. 1.5
- d. -6
- e. 6

**ANSWER:** a

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 3/31/2016 5:49 AM

**DATE MODIFIED:** 10/17/2016 5:31 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

3. Based on the following table, find  $f(-2) - f(1)$ .

|        |    |    |    |    |   |   |     |
|--------|----|----|----|----|---|---|-----|
| $x$    | -3 | -2 | -1 | 0  | 1 | 2 | 3   |
| $f(x)$ | 1  | 5  | 1  | -2 | 1 | 1 | 0.1 |

- a. 4
- b. -5
- c. -4
- d. -9
- e. 2

ANSWER: a

POINTS: 1

QUESTION TYPE: Multiple Choice

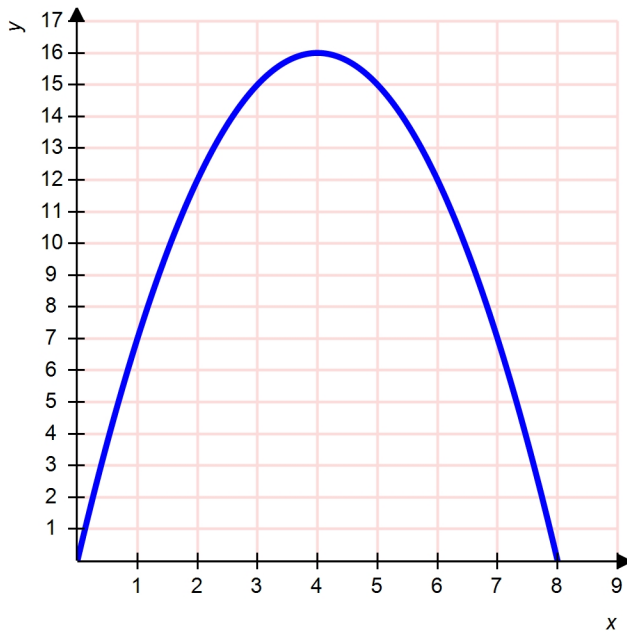
HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 10/17/2016 4:01 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

4. Use the graph of the function  $f$  to find  $f(7)$ .



- a. 6
- b. 5
- c. 4
- d. 11
- e. 7

ANSWER: e

POINTS: 1

QUESTION TYPE: Multiple Choice

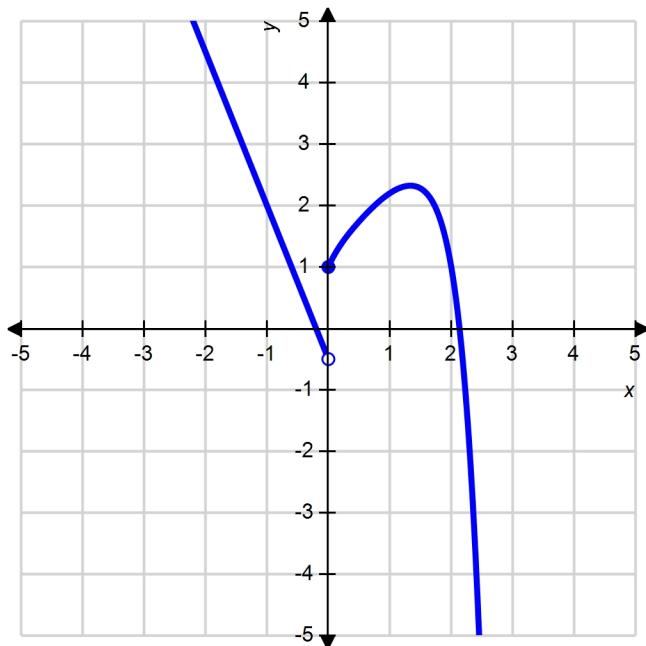
HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 10/17/2016 4:10 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

5. Use the graph of the function  $f$  to find  $f(0)$ .



- a. 2
- b. 0
- c. -1
- d. 1
- e. -0.5

ANSWER: d

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 5/18/2016 6:13 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

6. Given  $f(x) = -5x - 6$ , find  $f(-6)$ .

- a. -24
- b. 66
- c. 24
- d. 36
- e. -36

ANSWER: c

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 3/31/2016 4:24 AM

7. Given  $f(x) = \sqrt{24 + x^2}$ , find  $f(-1)$ .

- a. 25
- b. -5
- c.  $\sqrt{23}$
- d. 23
- e. 5

ANSWER: e

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 3/31/2016 4:27 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

8. Given  $f(x) = -5x + 2$ , find  $f(a + b)$ .

- a.  $-5a + 2b$
- b.  $-5b + 2a$
- c.  $-5(a + b) + 4$
- d.  $-5(a + b) + 2$
- e.  $-5(a + b) + 2(a + b)$

**ANSWER:** d

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/31/2016 4:21 AM

9. Given  $f(x) = x^2 + 5x + 5$ , find  $f(-4)$ .

- a. -31
- b. 1
- c. -19
- d. 31
- e. -23

**ANSWER:** b

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/31/2016 4:16 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

10. Given  $g(s) = s^2 + \frac{4}{s}$ , find  $g(2)$ .

- a. 6
- b. -2
- c. 4
- d. 2
- e. 12

ANSWER: a

POINTS: 1

QUESTION TYPE: Multiple Choice

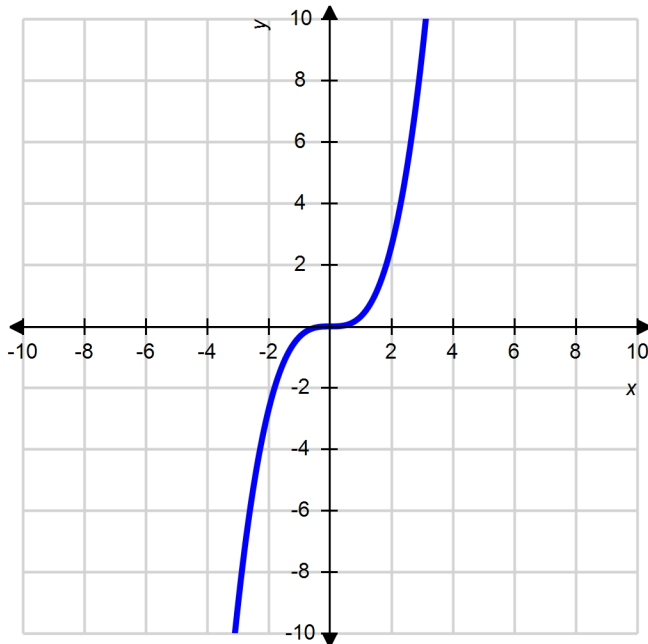
HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

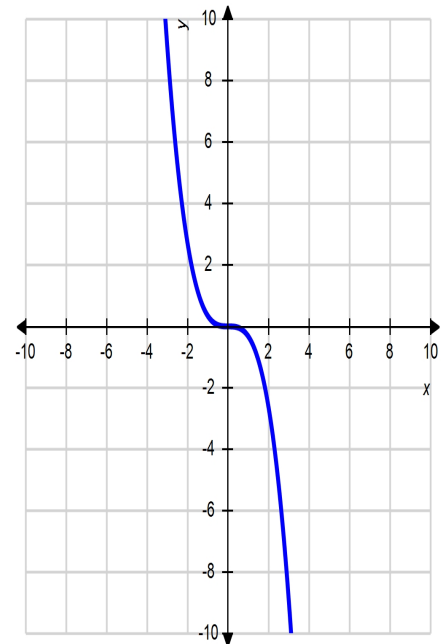
DATE MODIFIED: 3/31/2016 4:14 AM

11. Choose the graph of the function  $f(x) = -\frac{x^3}{3}$ , domain  $(-\infty, \infty)$  from the following:

a.



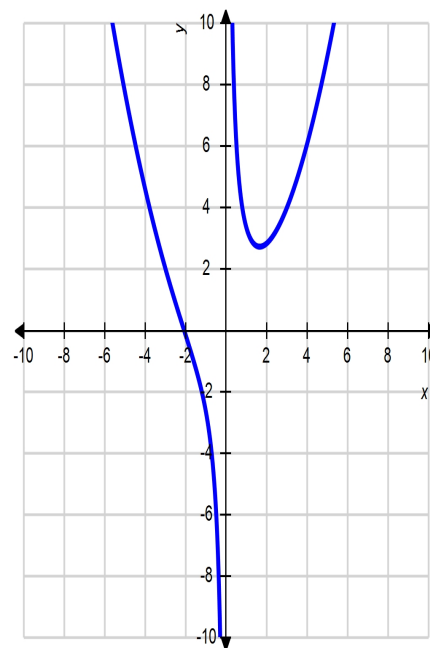
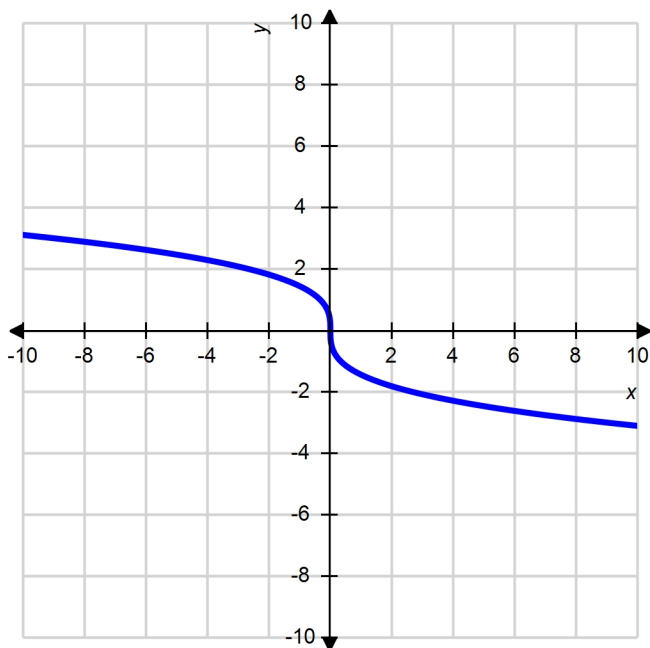
b.



c.

d.

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints



ANSWER: b

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 5/18/2016 6:23 AM

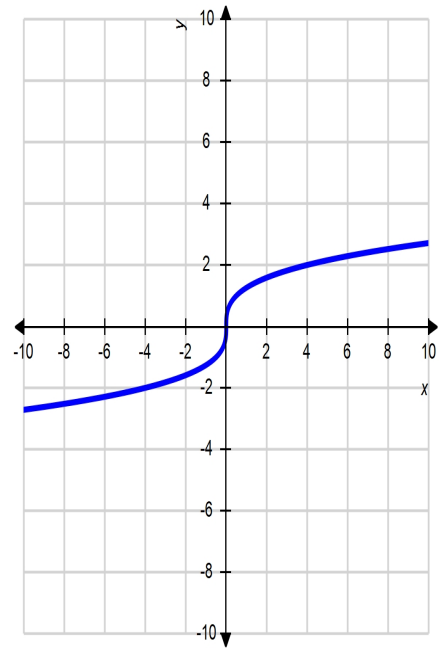
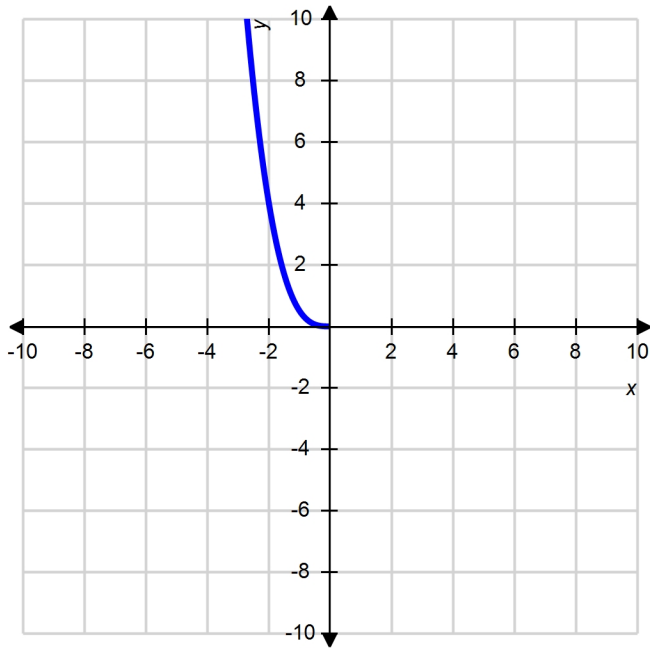
12. Choose the graph of the function  $f(x) = \frac{x^3}{2}$ , domain  $[0, \infty)$  from the following:

a.

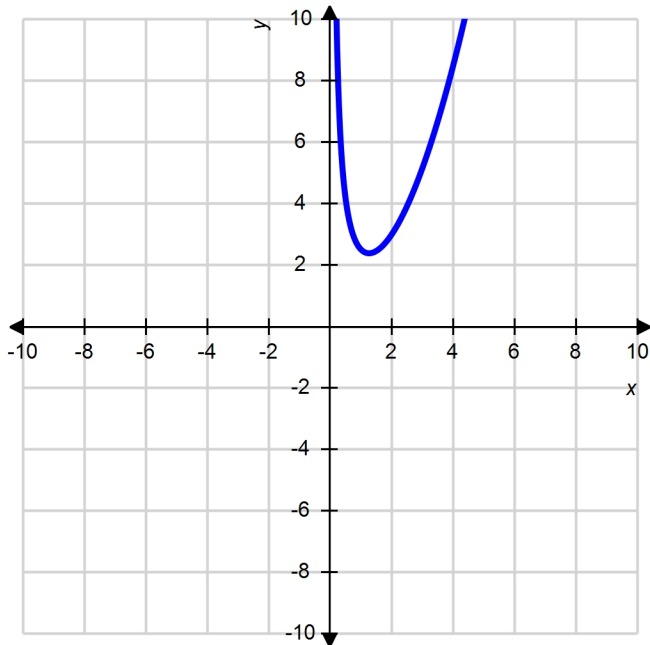
b.



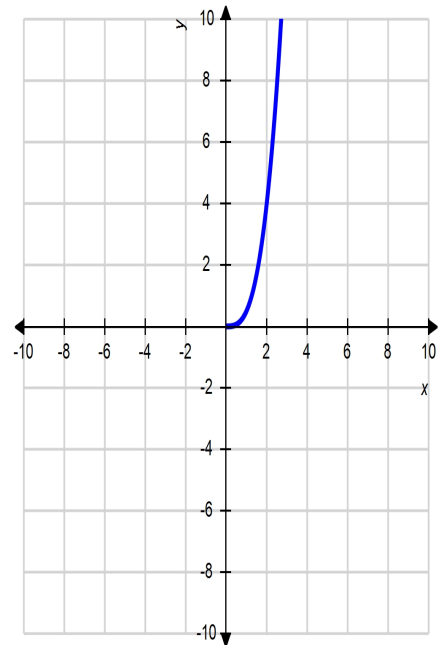
**1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints**



c.



d.



**ANSWER:** d  
**POINTS:** 1  
**QUESTION TYPE:** Multiple Choice  
**HAS VARIABLES:** True

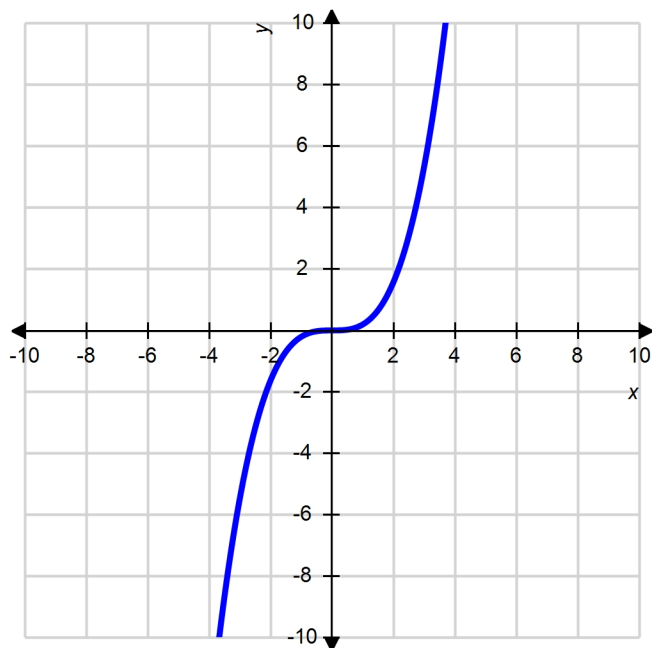
## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

DATE CREATED: 2/10/2016 3:41 PM

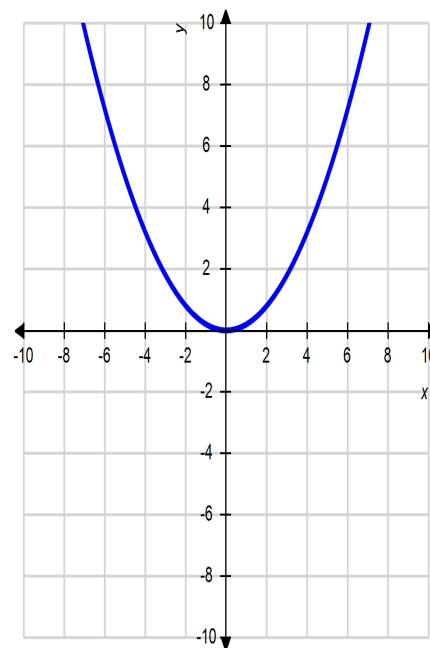
DATE MODIFIED: 5/18/2016 6:24 AM

13. Choose the graph of the function  $f(x) = \frac{x^4}{5}$ , domain  $(-\infty, \infty)$  from the following:

a.



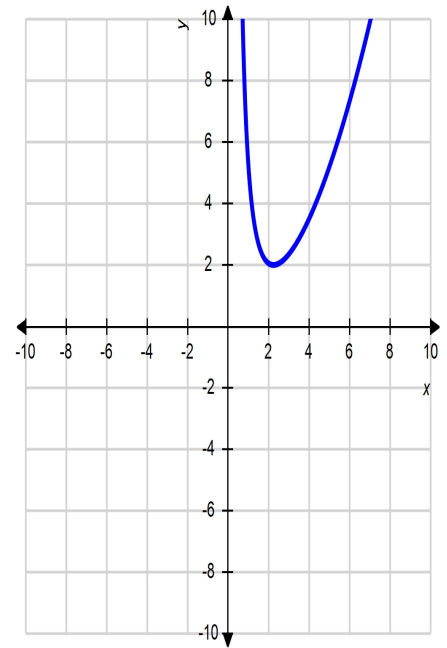
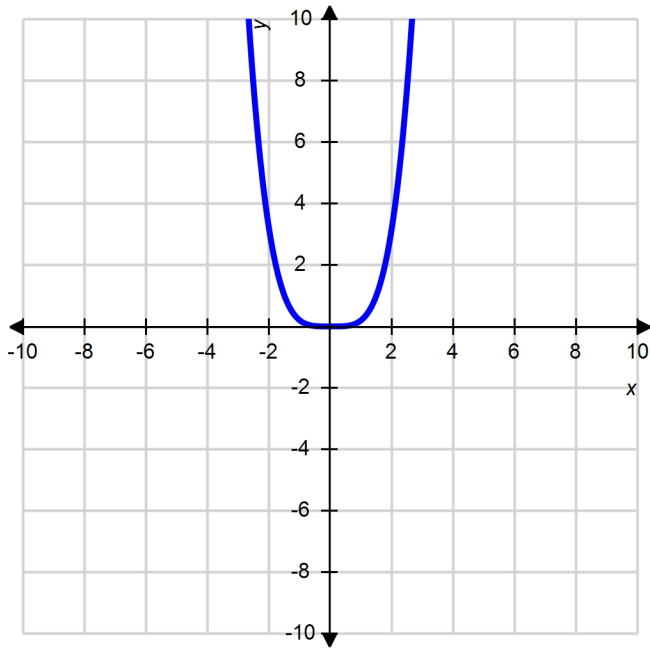
b.



c.

d.

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints



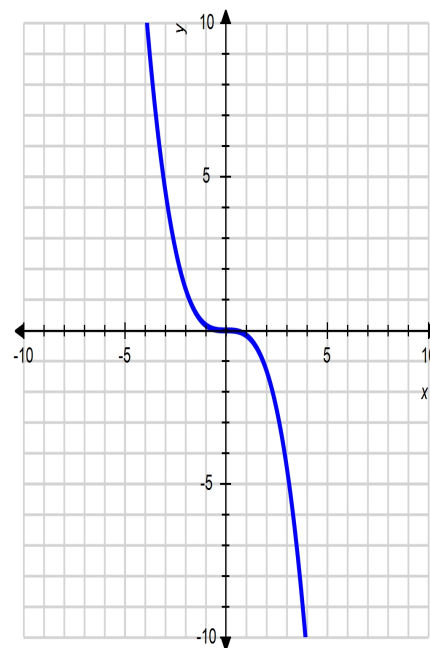
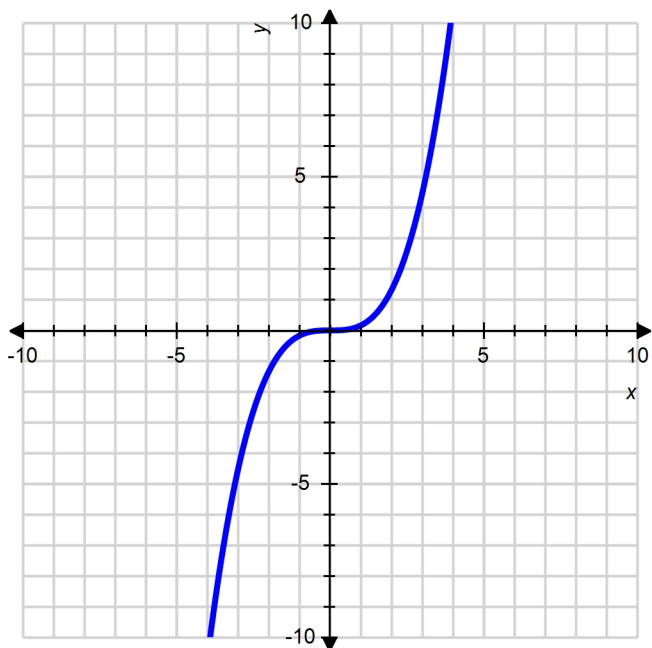
**ANSWER:** c  
**POINTS:** 1  
**QUESTION TYPE:** Multiple Choice  
**HAS VARIABLES:** True  
**DATE CREATED:** 2/10/2016 3:41 PM  
**DATE MODIFIED:** 10/17/2016 4:22 AM

14. Choose the graph of the function  $f(x) = 6\sqrt[3]{x}$ , domain  $(-\infty, \infty)$  from the following:

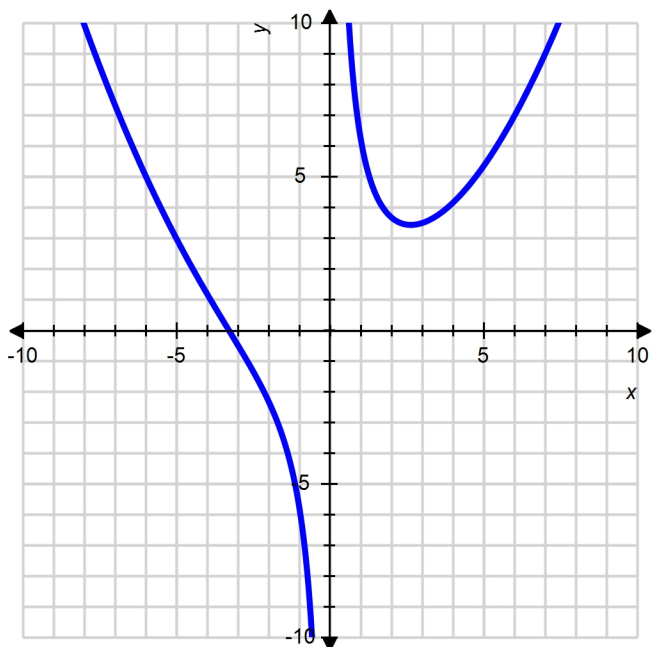
a.

b.

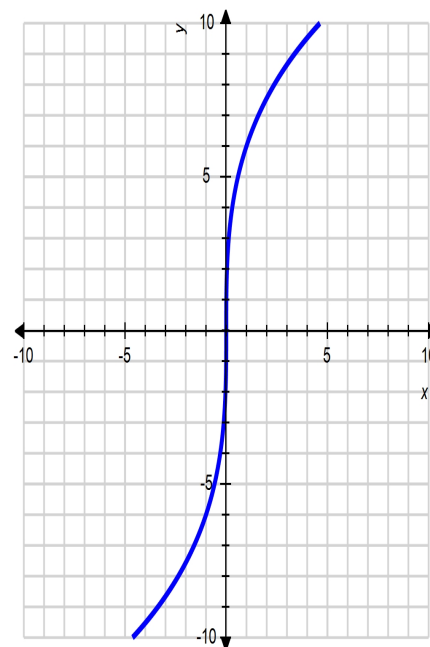
## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints



c.



d.



ANSWER: d

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 5/18/2016 6:30 AM

15. Use technology (such as spreadsheet web site utilities, or a graphing calculator) to evaluate the function for  $x = 5.5$ .

$$f(x) = 0.8x^2 - 6x + 7$$

- a. -15.8
- b. -1.8
- c. 64.2
- d. -17.2
- e. 50.2

ANSWER: b

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 3/30/2016 10:35 AM

16. Use technology (such as spreadsheet web site utilities, or a graphing calculator) to evaluate the function for  $x = 5.1$ .

$$r(x) = \frac{4x^2 - 8}{4x^2 + 8}$$

Round the answer to four decimal places if necessary.

- a. 0.8572
- b. 1.1666
- c. 0.6721
- d. 1
- e. 28.4

ANSWER: a

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 3/30/2016 10:32 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

17. Function  $f$  is  $f(x) = \begin{cases} 3x & \text{if } 0 \leq x < 17 \\ 7 & \text{if } 17 \leq x < 34 \end{cases}$ .

Find  $f(19)$ .

- a. 63
- b. 57
- c. 7
- d. 60
- e. 54

**ANSWER:** c

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 10/17/2016 4:26 AM

18. Function  $f$  is  $f(x) = \begin{cases} -4 & \text{if } 0 \leq x < 17 \\ -8x & \text{if } 17 \leq x < 34 \end{cases}$ .

Find  $f(26)$ .

- a. -208
- b. 34
- c. -212
- d. 4
- e. -4

**ANSWER:** a

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/30/2016 10:22 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

19. Function  $f$  is  $f(x) = \begin{cases} x^2 & \text{if } -10 < x \leq 0 \\ \sqrt{x} & \text{if } 0 < x \leq 46 \end{cases}$ .

Find  $f(36)$ .

- a. 6
- b. No solution
- c. 7
- d. -6
- e. 1296

**ANSWER:** a

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 10/17/2016 4:30 AM

20. Function  $f$  is  $f(x) = \begin{cases} 4x & \text{if } 0 < x < 15 \\ x + 9 & \text{if } 15 \leq x < 30 \\ 4x & \text{if } 30 \leq x \leq 45 \end{cases}$ .

Find  $f(18)$ .

- a. 27
- b. 31
- c. 30
- d. 18
- e. 42

**ANSWER:** a

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

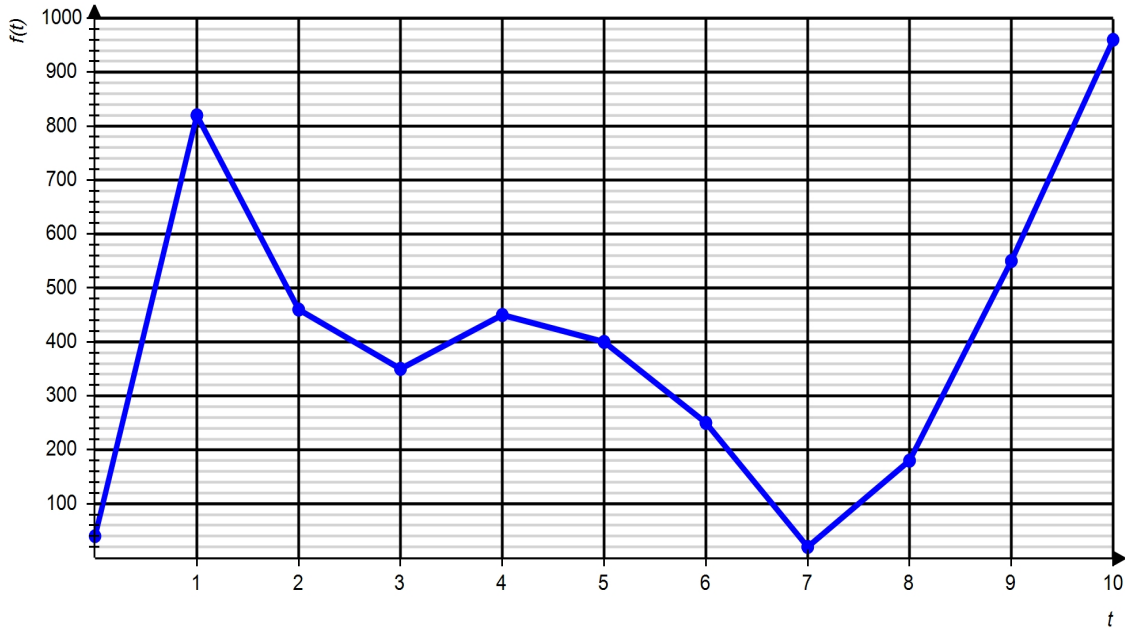
**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/30/2016 9:59 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

21. Graph shows the number of sports utility vehicles  $f(t)$  sold in the United States.  $f(t)$  represents sales in year  $t$  in thousand vehicles. Find  $f(4)$ .



- a. 250
- b. 450
- c. 400
- d. 350
- e. 550

ANSWER: b

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

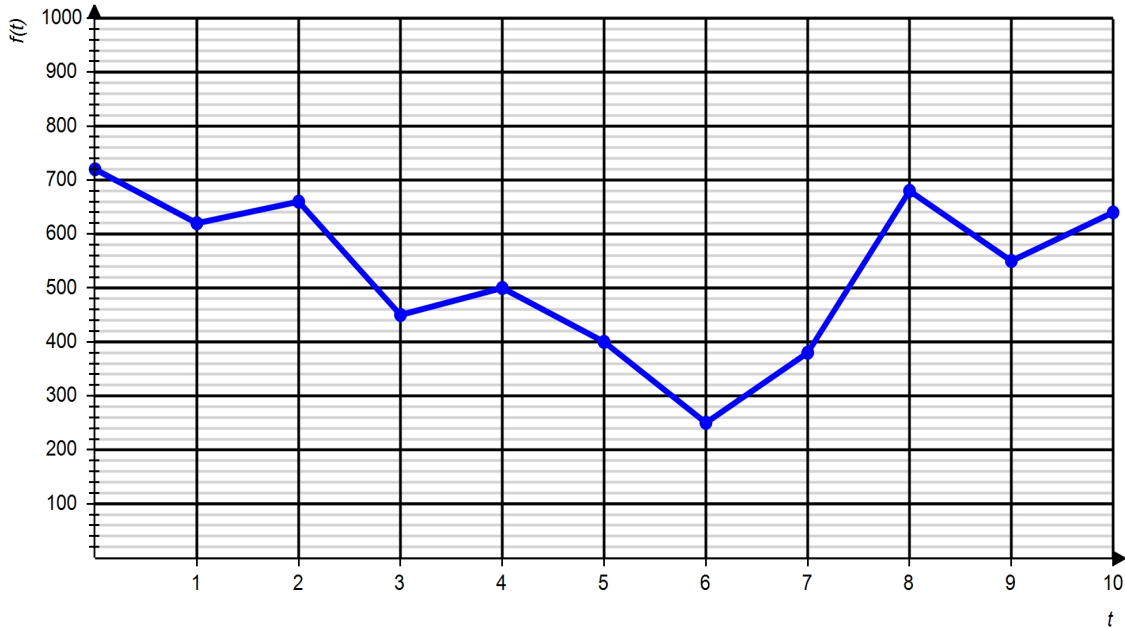
DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 5/24/2016 3:20 AM



## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

22. Graph shows the number of sports utility vehicles  $f(t)$  sold in the United States.  $f(t)$  represents sales in year  $t$  in thousand vehicles. Find  $f(4)$ .



- a. 250
- b. 500
- c. 400
- d. 450
- e. 550

ANSWER: b

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 3/30/2016 8:31 AM

DATE MODIFIED: 5/18/2016 6:56 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

23. The value of U.S. trade with China from 1994 through 2004 can be approximated by  $C(t) = 3t^2 - 7t + 50$  billion dollars ( $t$  is time in years since 1994).

Find an appropriate domain of  $C$ .

- a.  $[0, +\infty]$
- b.  $[10, +\infty]$
- c.  $[1994, 2004]$
- d.  $[0, 10]$
- e.  $[1994, +\infty]$

ANSWER: d

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 4/4/2016 8:33 AM

24. The number of research articles in *Physics Review* that were written by researchers in the U.S. from 1983 through 1996 can be approximated by  $A(t) = -0.01t^2 + 0.24t + 3.4$  hundred articles ( $t$  is time in years since 1983).

Find an appropriate domain of  $A$ .

- a.  $[1983, 1996]$
- b.  $[1983, +\infty]$
- c.  $[-\infty, 0]$
- d.  $[0, 13]$
- e.  $[-\infty, 13]$

ANSWER: d

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 10/17/2016 4:40 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

25. The processor speed, in megahertz, of Intel processors could be approximated by the function of time  $t$  in years since the start of 1995.

$$P(t) = \begin{cases} 75t + 200 & \text{if } 0 \leq t \leq 4 \\ 600t - 1,900 & \text{if } 4 < t \leq 9 \end{cases}$$

Use the model to estimate when processor speeds first hit 3.2 gigahertz (1 gigahertz = 1,000 megahertz).

- a.  $t = 6.5$
- b.  $t = 8.8$
- c.  $t = 8.5$
- d.  $t = 9.0$
- e.  $t = 8.2$

**ANSWER:** c

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** False

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/30/2016 9:02 AM

26. The value of the Conference Board Index of 10 economic indicators in the U.S. could be approximated by the function of time  $t$  in months since the end of December 2002.

$$E(t) = \begin{cases} 0.4t + 110 & \text{if } 6 \leq t \leq 15 \\ -0.2t + 119 & \text{if } 15 < t \leq 20 \end{cases}$$

Use the model to estimate when - prior to March, 2004 - the index was 113.

- a.  $t = 7.8$  months
- b.  $t = 7.5$  months
- c.  $t = 7.4$  months
- d.  $t = 6.5$  months
- e.  $t = 7.0$  months

**ANSWER:** b

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** False

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 10/17/2016 5:24 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

27. The percentage  $p(t)$  of children who are able to speak in at least single words by the age of  $t$  months can be approximated by the equation.

$$p(t) = 100 \left( 1 - \frac{12,416}{t^{4.79}} \right)$$

What percent of children are able to speak in at least single words by the age of 12 months? Round to the nearest percent.

- a. 8%
- b. 67%
- c. 92%
- d. 85%
- e. 79%

**ANSWER:** c

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/30/2016 9:12 AM

28. The percentage  $p(t)$  of children who are able to speak in at least single words by the age of  $t$  months can be approximated by the equation.

$$p(t) = 100 \left( 1 - \frac{12,209}{t^{4.865}} \right)$$

By what age are 80% of children speaking in at least single words? Round your answer to the nearest month.

- a. 10
- b. 6
- c. 7
- d. 15
- e. 4

**ANSWER:** a

**POINTS:** 1

**QUESTION TYPE:** Multiple Choice

**HAS VARIABLES:** True

**DATE CREATED:** 2/10/2016 3:41 PM

**DATE MODIFIED:** 3/30/2016 9:15 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

29. Write the equation  $y = 4x^2 - 9$  using function notation.

a.  $4x^2 - 9 - y = 0$

b.  $y = 4x^2 - 9$

c.  $y(x) = 4x^2 - 9$

d.  $f(4x^2 - 9)$

e.  $4x^2 - 9 = 0$

ANSWER: c

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 3/30/2016 9:23 AM

30. If the revenue  $R$  is specified as a function of time  $t$ , which variable is independent?

a.  $t$

b.  $R$

ANSWER: a

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 3/30/2016 9:18 AM

31. Based on the following table, find  $f(-3)$ .

|        |    |    |    |    |   |     |     |
|--------|----|----|----|----|---|-----|-----|
| $x$    | -3 | -2 | -1 | 0  | 1 | 2   | 3   |
| $f(x)$ | 5  | 2  | 5  | -2 | 1 | 0.4 | 1.5 |

ANSWER: 5

POINTS: 1

QUESTION TYPE: Numeric Response

HAS VARIABLES: True

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 10/17/2016 4:46 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

32. Given  $f(x) = \sqrt{15 + x^2}$ , find  $f(-1)$ .

ANSWER: 4  
POINTS: 1  
QUESTION TYPE: Numeric Response  
HAS VARIABLES: True  
DATE CREATED: 2/10/2016 3:41 PM  
DATE MODIFIED: 3/30/2016 9:34 AM

33. Given  $f(x) = 2x - 10$ , find  $f(-5)$ .

ANSWER: -20  
POINTS: 1  
QUESTION TYPE: Numeric Response  
HAS VARIABLES: True  
DATE CREATED: 2/10/2016 3:41 PM  
DATE MODIFIED: 3/30/2016 9:35 AM

34. Given  $f(x) = x^2 + 5x + 1$ , find  $f(-4)$ .

ANSWER: -3  
POINTS: 1  
QUESTION TYPE: Numeric Response  
HAS VARIABLES: True  
DATE CREATED: 2/10/2016 3:41 PM  
DATE MODIFIED: 3/30/2016 9:38 AM

35. Given  $g(s) = s^2 + \frac{2}{s}$ , find  $g(-1)$ .

ANSWER: -1  
POINTS: 1  
QUESTION TYPE: Numeric Response  
HAS VARIABLES: True  
DATE CREATED: 2/10/2016 3:41 PM  
DATE MODIFIED: 3/30/2016 9:38 AM

36. Given  $f(x) = 5x + 2$ , find  $f(a + b)$ .

ANSWER:  $5(a + b) + 2$   
POINTS: 1  
QUESTION TYPE: Subjective Short Answer  
HAS VARIABLES: True  
DATE CREATED: 2/10/2016 3:41 PM  
DATE MODIFIED: 3/30/2016 9:41 AM

## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

Match each function with the corresponding graph.

a.  $f(x) = 3x, (-3 \leq x \leq 3)$

b.  $f(x) = -3x, (-3 \leq x \leq 3)$

c.  $f(x) = |3x|, (-3 \leq x \leq 3)$

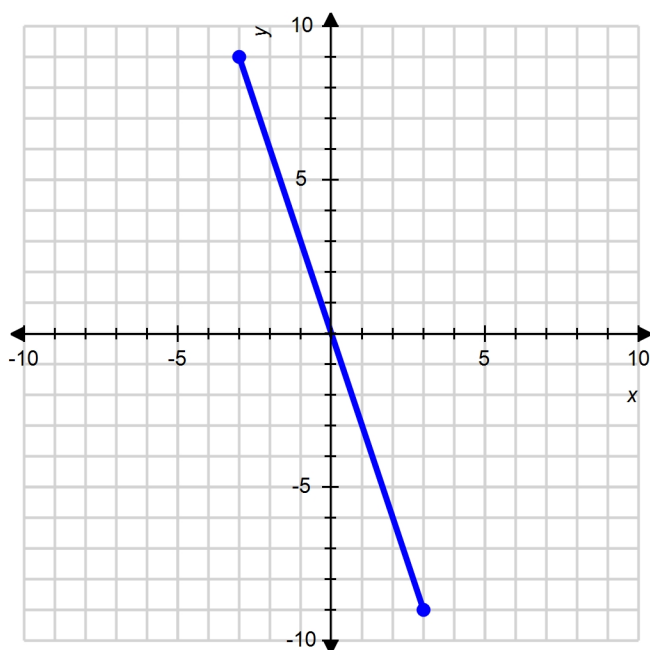
QUESTION TYPE: Matching

HAS VARIABLES: False

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 5/18/2016 7:01 AM

37.

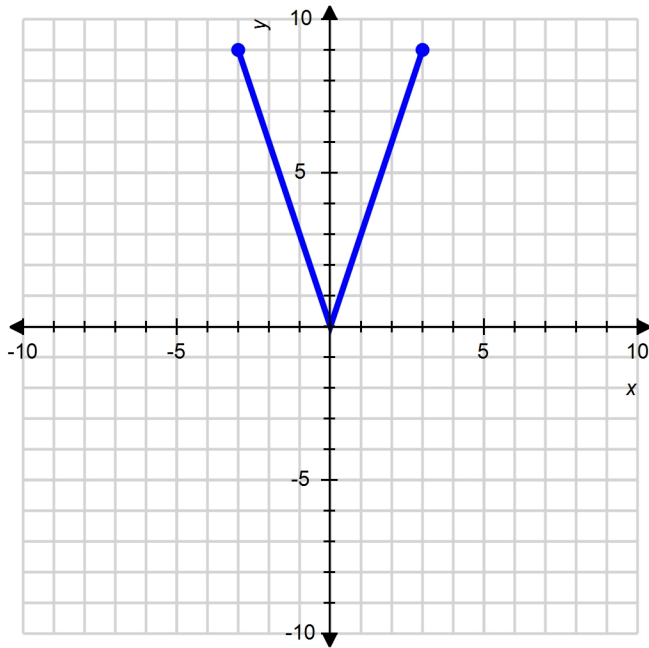


ANSWER: b

POINTS: 1

**1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints**

38.



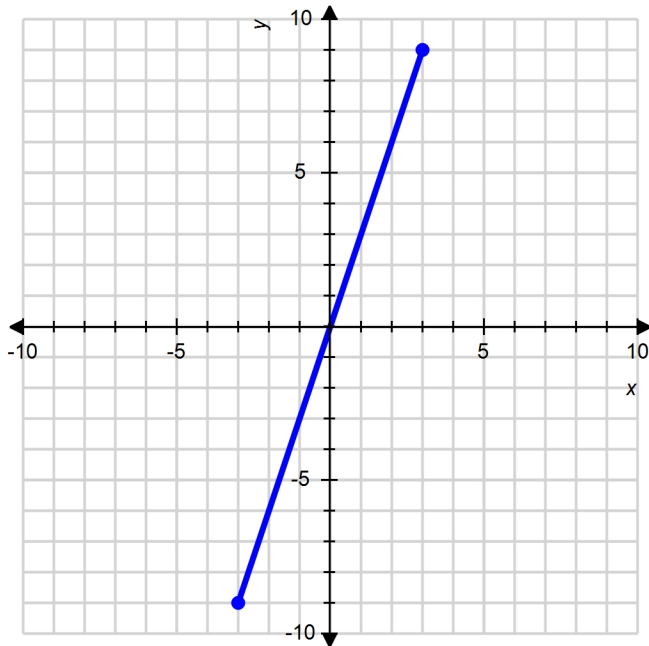
ANSWER: c

POINTS: 1



## 1.1 Functions from the Numerical, Algebraic, and Graphical Viewpoints

39.



ANSWER: a

POINTS: 1

If the income  $I$  is specified as a function of selling price  $s$ , which variable is independent and which one is dependent?

*Choose the correct letter for each question.*

a.  $s$

b.  $I$

QUESTION TYPE: Matching

HAS VARIABLES: False

DATE CREATED: 2/10/2016 3:41 PM

DATE MODIFIED: 10/17/2016 4:54 AM

40. Dependent variable

ANSWER: b

POINTS: 1

41. Independent variable

ANSWER: a

POINTS: 1