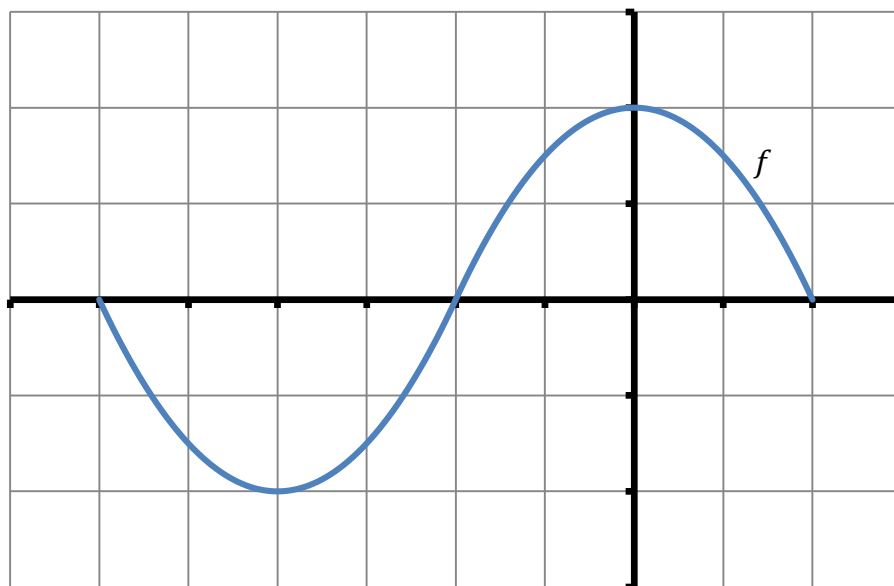
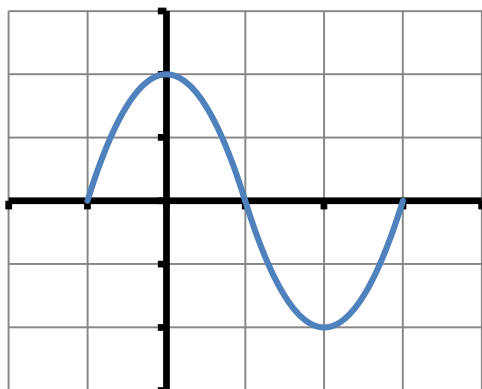


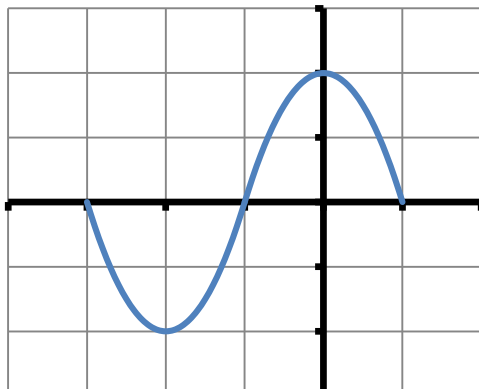
1. Given below is the graph of a function  $f$ . Which of the following graphs represents the transformation  $y = f(-2x)$ ? (*Lesson 23*)



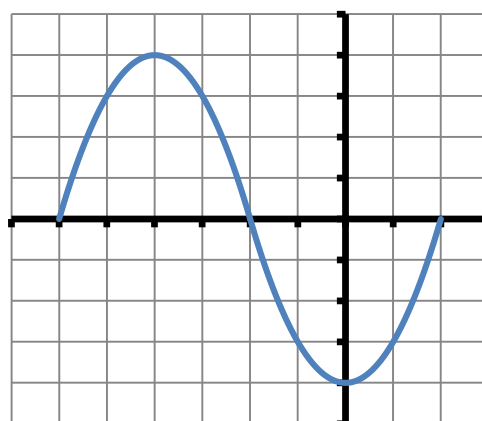
A.



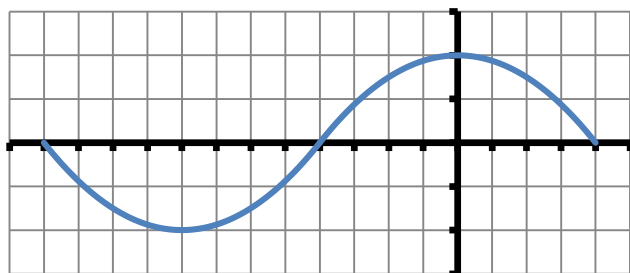
B.



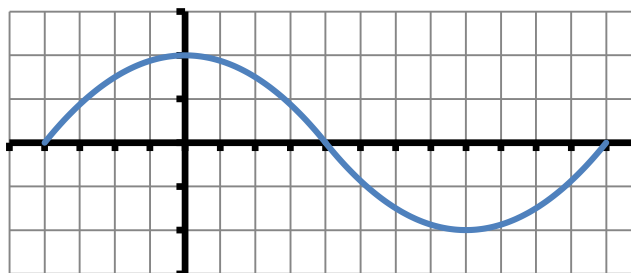
C.



D.



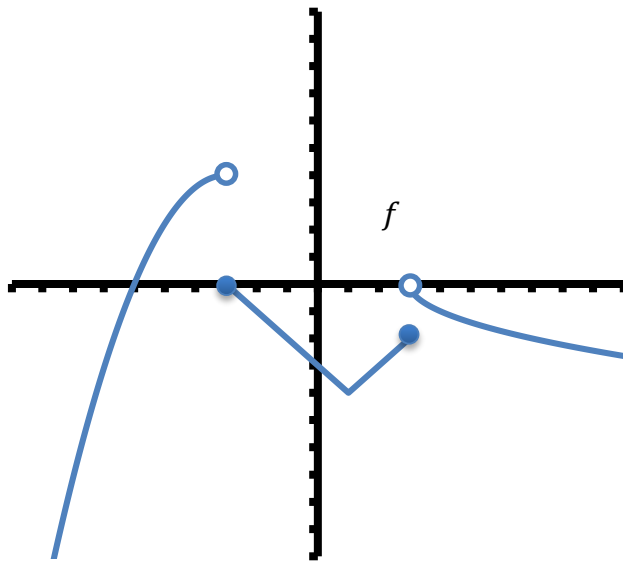
E.



2. Let  $y = f(x)$  be a function with domain  $D = [-8, 7]$  and range  $R = [-9, 12]$ . Find the range of the function  $y = -f(x - 3) - 2$ . (*Lesson 23*)

- A.  $[-9, 6]$
- B.  $[-11, 4]$
- C.  $[-10, 11]$
- D.  $[-14, 7]$
- E.  $[-5, 10]$

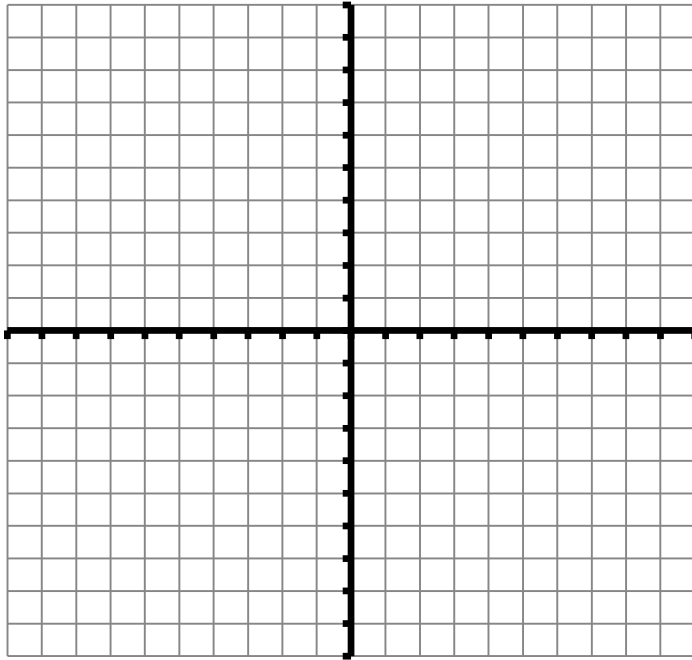
3. Given the graph of the function  $f$  below, determine which of the following statements is/are true. (each tick mark represents 1 unit) (*Lesson 24*)



- |      |  |
|------|--|
| I.   | $f$ is increasing on the intervals $(-\infty, -3) \cup [1, 3]$ |
| II.  | the range of $f$ is $(-\infty, \infty)$                        |
| III. | $f$ has three $x$ -intercepts                                  |

- A. I only
- B. I and II only
- C. I and III only
- D. I, II, and III are all true
- E. I, II, and III are all false

4. Given the quadratic function  $f(x) = -x^2 - 4x - 1$ , determine which of the following statements is/are true. (*Lesson 25*)



- |      |  |
|------|--|
| I.   | The zeros of the function are $-2 \pm \sqrt{12}$ |
| II.  | The y-intercept of the function is $(0, 3)$      |
| III. | The minimum function value is 3                  |

- A. I and II only  
B. I and III only  
C. II and III only  
D. I, II, and III are all true  
E. I, II, and III are all false

5. Find the standard equation of a parabola with a vertical axis that has a vertex of  $(-3, -5)$  and an x-intercept of 2. (*Lesson 25*)

- A.  $y = -\frac{1}{5}(x + 3)^2 - 5$   
B.  $y = -\frac{1}{5}(x - 3)^2 + 5$   
C.  $y = \frac{1}{5}(x + 3)^2 - 5$   
D.  $y = \frac{1}{5}(x - 3)^2 + 5$   
E. None of the above

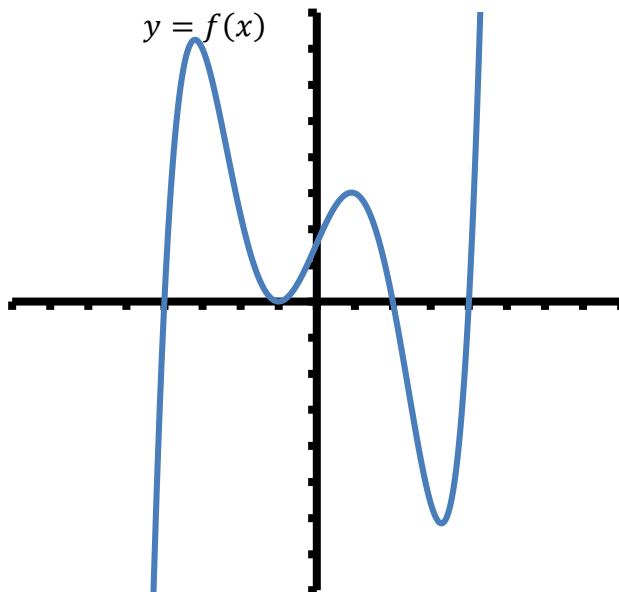
6. Given that  $f$  is a function such that  $f(2) = 5$  and  $f(-1) = 3$ , and  $g$  is a function such that  $g(3) = 8$  and  $g(-1) = 2$ , find and simplify  $(g \circ f)(-1)$ . (*Lesson 27*)

- A. 5
- B. 6
- C. 8
- D. 2
- E. Cannot be determined

7. Solve the inequality  $(x + 2)^2 < x + 2$ , and express the solution set in interval notation. (*Lesson 28*)

- A.  $(-\infty, -2) \cup (-1, \infty)$
- B.  $(-2, -1)$
- C.  $(-\infty, -2)$
- D.  $(x + 2)^2$  is never less than  $x + 2$
- E. None of the above

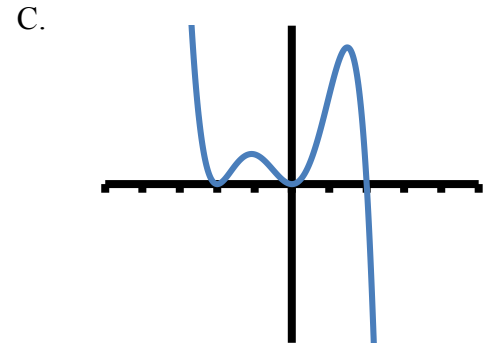
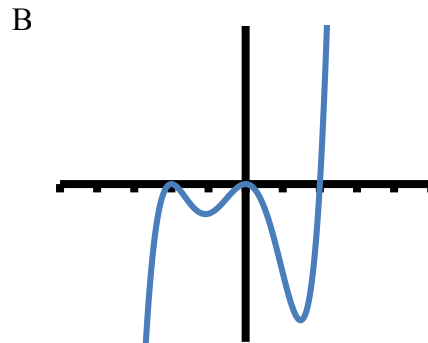
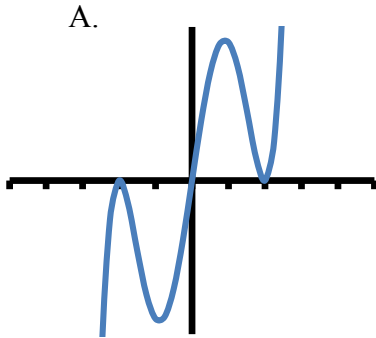
8. Determine which of the following statements is/are true about the graph of the function  $y = f(x)$  given below? (assume each tick mark represents 1 unit) (*Lesson 29*)



- |      |  |
|------|--|
| I.   | The range of the function is $(-\infty, \infty)$       |
| II.  | The zeros of the function are $-4, -2, 1$ , and $4$    |
| III. | $f(x) > 0$ on the intervals $[-4, 2] \cup [4, \infty)$ |

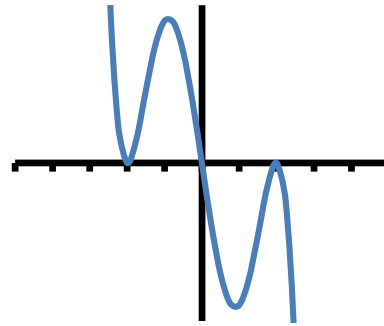
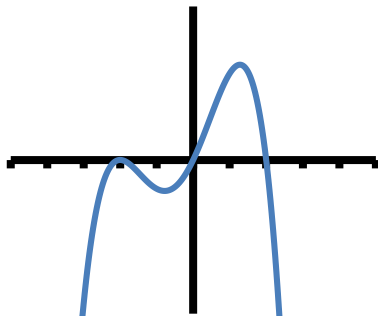
- A. I only
- B. I and II only
- C. I and III only
- D. I, II, and III are all true
- E. I, II, and III are all false

9. Which of the following graphs corresponds with the sign chart of the function  $y = f(x)$  given below? (assume each tick mark represents 1 unit) (*Lesson 29*)



D.

E.



10. Solve the system of equations for  $y$ . (*Lesson 31*)

$$\begin{cases} y = \frac{24}{x} \\ x - y = 10 \end{cases}$$

- A.  $y = -2, 12$   
 B.  $y = -12, 2$   
 C.  $y = -4, 6$   
 D.  $y = -6, 4$   
 E. None of the above

11. Solve the system of equations and determine where the graphs of the equations will intersect.

(Lesson 31)

$$\begin{cases} x^2 + y^2 = 25 \\ x^2 - y + 5 = 0 \end{cases}$$

- A. Above the  $x$ -axis
- B. Below the  $x$ -axis
- C. On the  $x$ -axis
- D. The graphs intersect at more than one point
- E. The graphs do not intersect

12. Solve the system of equations for  $y$ . (Lesson 32)

$$\begin{cases} x - 3y = 1 \\ -2x + 6y = 2 \end{cases}$$

- A.  $y = \frac{1}{2}$
- B.  $y = 0$
- C. There is no solution
- D. There are infinitely many solutions
- E. None of the above

13. An object is projected vertically upward from the top of a building. Its distance  $s(t)$  in feet above the ground after  $t$  seconds is given by the function  $s(t) = -16t^2 + 128t + 80$ . What is the height of the building? (Lesson 26)

- A. 4 feet
- B. 128 feet
- C. 336 feet
- D. Not enough information provided
- E. None of the above

14. An MA 15300 student's exam scores are directly proportional to the product of the number of days in advance of the exam that they started preparing and the total number of hours spent preparing. If a student started preparing 15 days in advance of the exam, spent a total of 25 hours preparing, and scored a 93 on the exam, determine the value of the constant of proportionality  $k$ . (*Lesson 30*)

- A. The value of  $k$  is less than 1
- B. The value of  $k$  is between 1 and 10
- C. The value of  $k$  is between 10 and 50
- D. The value of  $k$  is between 50 and 100
- E. The value of  $k$  is more than 100

15. A woman rows a boat 1.75 miles upstream against a constant current in 35 minutes. She then rows the same distance downstream (with the same current) in 15 minutes. What is the rate of the current? (*Lesson 33*)

- A. 2 mph
- B. 5 mph
- C.  $\frac{1}{30}$  mph
- D. 1 mph
- E.  $\frac{17}{60}$  mph