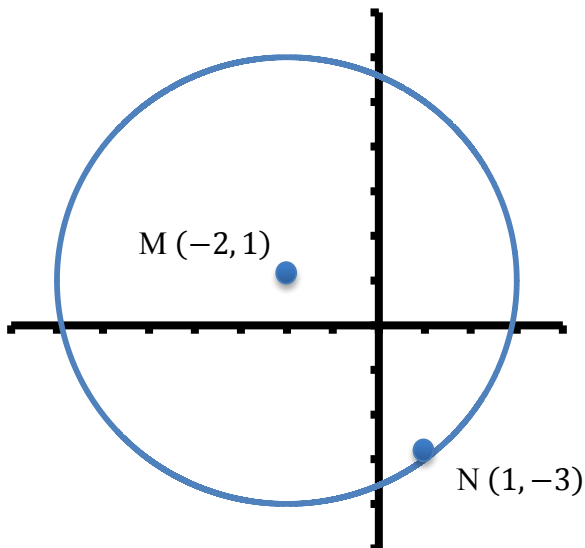


1. Describe the set of all points  $(x, y)$  in the coordinate plane, such that  $\frac{y}{x} > 0$ . (*Lesson 16*)

- A. The set of all points in quadrants II and IV only.
- B. The set of all points in quadrants I and III only.
- C. The set of all points in quadrants I and II only.
- D. The set of all points in quadrants III and IV only.
- E. None of the above

2. Find an equation for the circle below centered at the point M and passing through the point N. (assume each tick mark represents 1 unit) (*Lesson 17*)

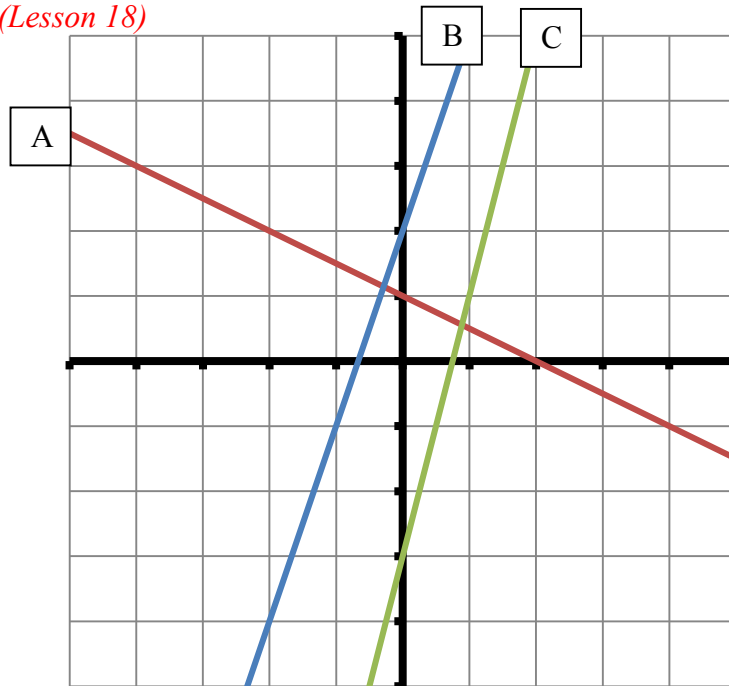


- A.  $x^2 + y^2 + 4x - 2y - 20 = 0$
- B.  $x^2 + y^2 - 4x + 2y - 20 = 0$
- C.  $x^2 + y^2 + 4x - 2y = 0$
- D.  $x^2 + y^2 - 4x - 2y = 0$
- E.  $x^2 + y^2 - 20 = 0$

3. Find an equation of the line through  $A\left(\frac{1}{2}, -\frac{1}{3}\right)$  that is parallel to the line  $6x + 2y + 5 = 0$ . (*Lesson 18*)

- A.  $18x + 6y = 7$
- B.  $18x - 6y = 11$
- C.  $2x - 6y = 3$
- D.  $2x + 6y = -1$
- E. None of the above

4. Which of the following statements is/are true about the lines given below? (assume each tick mark represents 1 unit) (*Lesson 18*)



- I. Line A is perpendicular to either line B or line C (or both)  
II. Lines B and C are parallel  
III. The general form of the equation for line A is  $x + 2y = 2$

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

5. Find the domain of  $f(x) = \sqrt{3 - 4x}$ . Express in interval notation. (*Lesson 20*)

- A.  $(-\infty, \frac{3}{4})$   
B.  $(-\infty, \frac{3}{4}]$   
C.  $[\frac{3}{4}, \infty)$   
D.  $(\frac{3}{4}, \infty)$   
E.  $(-\infty, \infty)$

6. If  $f(x) = \frac{\sqrt{x+3}}{x}$ , calculate  $f(3)$  and  $\frac{1}{f(-3)}$ . (Lesson 20)

A.  $f(3) = \sqrt{3}, \frac{1}{f(-3)} = 0$

B.  $f(3) = \sqrt{2}, \frac{1}{f(-3)}$  is undefined

C.  $f(3) = \frac{\sqrt{6}}{3}, \frac{1}{f(-3)}$  is undefined

D.  $f(3) = 2, \frac{1}{f(-3)} = 0$

E. None of the above

7. If the point  $(-2, -6)$  is on the graph of a function  $y = f(x)$ , find the corresponding point on the graph of  $y = \frac{1}{3}f(-4x) - 5$ . (Lesson 22)

A.  $(8, -7)$

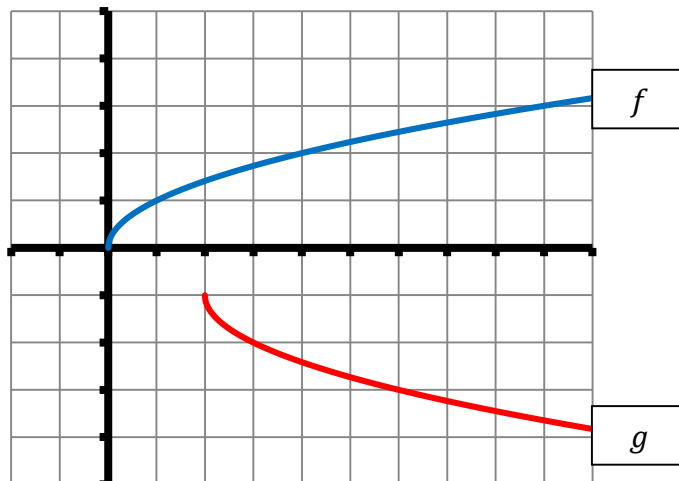
B.  $(\frac{1}{2}, -\frac{11}{3})$

C.  $(8, -\frac{11}{3})$

D.  $(\frac{1}{2}, -7)$

E. None of the above

8. The graph of the functions  $f$  and  $g$  are shown below. Use the properties of symmetry, shifts, and reflecting to find an equation for the graph of  $g$  in terms of  $f$ . (assume each tick mark represents 1 unit) (Lessons 22, 23)



A.  $y = f(2 - x) - 1$

B.  $y = -f(x - 2) - 1$

C.  $y = f(-x - 2) - 1$

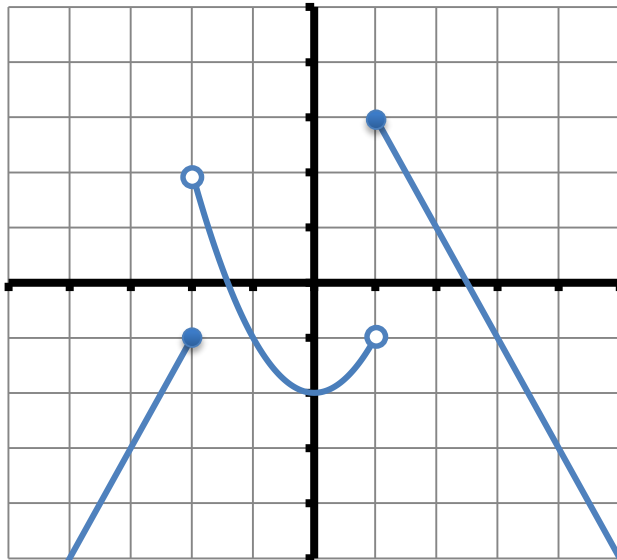
D.  $y = -f(x + 2) - 1$

E. None of the above

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

- A.  $\left[-\frac{7}{2}, 4\right]$   
 B.  $[-9, 12]$   
 C.  $\left[-6, \frac{9}{2}\right]$   
 D.  $[-24, 18]$   
 E. None of the above

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



- |      |  |
|------|--|
| I.   | $f$ is increasing on the intervals $(-\infty, -2] \cup [0, 1)$ |
| II.  | the range of $f$ is $(-\infty, 3]$                             |
| III. | $f$ has two $y$ -intercepts                                    |

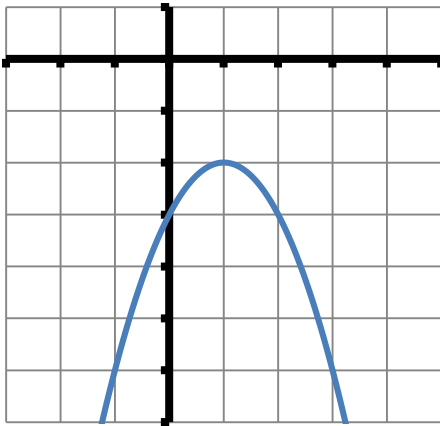
- A. I and II only  
 B. I and III only  
 C. II and III only  
 D. I, II, and III are all true  
 E. I, II, and III are all false

11. Express the function  $f(x) = -2x^2 + 12x - 14$  in the form  $y = a(x - h)^2 + k$ . (Lesson 25)

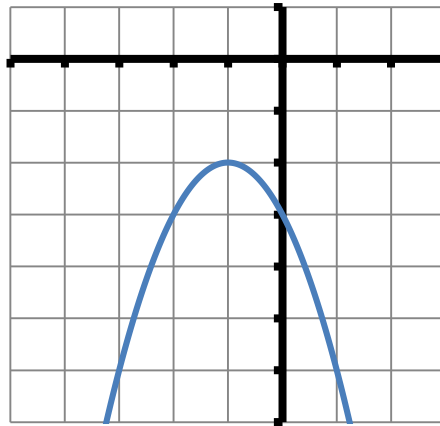
- A.  $y = -2(x + 3)^2 + 4$   
 B.  $y = -2(x + 3)^2 + 32$   
 C.  $y = -2(x - 3)^2 + 32$   
 D.  $y = -2(x - 3)^2 + 4$   
 E.  $y = -2(x - 6)^2 - 14$

12. Which of the following is the graph of  $f(x) = -x^2 + 2x - 3$ ?  
(assume each tick mark represents 1 unit) (*Lesson 25*)

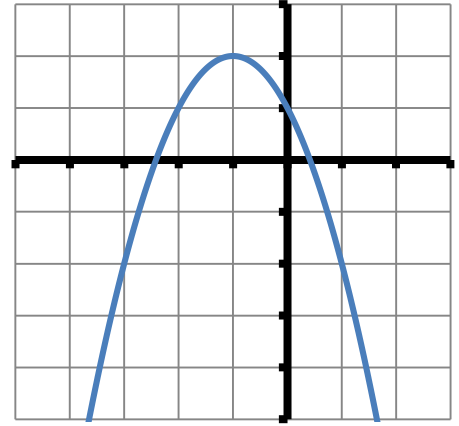
A.



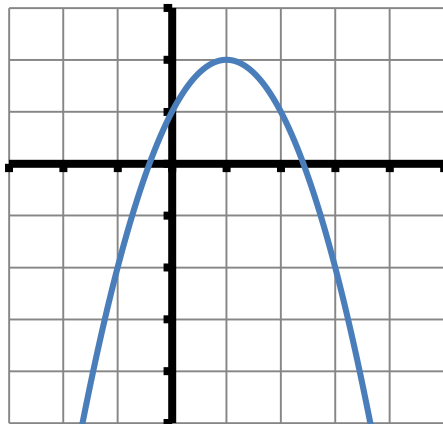
B.



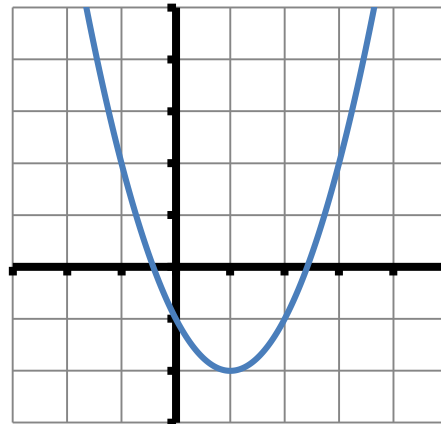
C.



D.



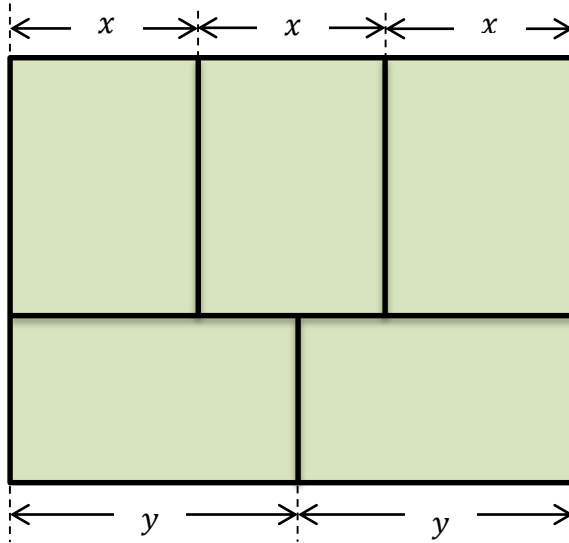
E.



13. Temperature readings on the Fahrenheit and Celsius scales are related by the formula  $C = \frac{5}{9}(F - 32)$ . When is the temperature reading on the Celsius scale half the temperature reading on the Fahrenheit scale? (*Lesson 19*)

- A. When the Celsius reading is less than  $-100^\circ$
- B. When the Celsius reading is between  $-100^\circ$  and  $0^\circ$
- C. When the Celsius reading is between  $0^\circ$  and  $100^\circ$
- D. When the Celsius reading is between  $100^\circ$  and  $200^\circ$
- E. When the Celsius reading is greater than  $200^\circ$

14. A pen consists of five congruent rectangles, as shown in the figure below. If the sides cost \$10 per running foot, express the cost  $C$  of the pen as a function of the length  $x$ . (hint: express  $y$  as a function of  $x$  first) (*Lesson 21*)



- A.  $C(x) = 18x$   
 B.  $C(x) = 18x^2$   
 C.  $C(x) = 180x$   
 D.  $C(x) = 180x^2$   
 E. Cannot be determined.

15. A manufacturer sells lamps for \$6 each. At this price, he sells 3,000 lamps. He wishes to raise the selling price, and knows that only 1,500 lamps will be sold if the selling price is \$8 each. Given that the selling price  $p$  and the number of lamps sold  $N$  are linearly related, express  $N$  as a function of  $p$ . (*Lesson 21*)

- A.  $N(p) = -\frac{1}{750}p + 7,500$   
 B.  $N(p) = -\frac{1}{750}p + 10$   
 C.  $N(p) = -750p + 7,500$   
 D.  $N(p) = -750p + 3,000$   
 E. None of the above