

1. Find the coordinates of point  $B(x, y)$  so that  $M(-1, 5)$  is the midpoint of segment  $AB$  where  $A(3, 2)$ .

A.  $\left(1, \frac{7}{2}\right)$

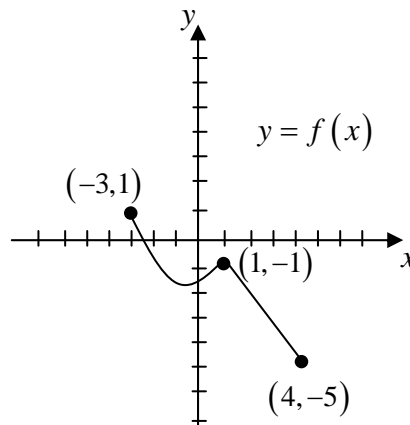
B.  $(-5, 8)$

C.  $(-4, 7)$

D.  $(3, -4)$

E.  $(-3, 6)$

Given below is the graph of a function,  $y = f(x)$ . Use this graph to answer questions #2 and #3:



2. Find the range of this function.

A.  $[-3, 4]$

B.  $[-5, 4]$

C.  $[-5, 1]$

D.  $[-3, 1]$

E. None of the above

3. Find  $f(1)$ .

A.  $f(1) = -2$

B.  $f(1) = 1$

C.  $f(1) = -3$

D.  $f(1) = 4$

E. None of the above

4. Solve the absolute value inequality given below. Express your answer in interval notation.

$$|2x-3| \geq 5$$

- A.  $[-1, 4]$
- B.  $[4, \infty)$
- C.  $(-\infty, -1] \cup [1, 4]$
- D.  $(-\infty, -1] \cup [4, \infty)$
- E. None of the above

5. If  $f(x) = \frac{x-3}{x^2+2}$ , find and simplify  $f(a+1)$ .

- A.  $\frac{a-3}{a^2+2}$
- B.  $\frac{a-2}{a^2+3}$
- C.  $-\frac{3}{a+3}$
- D.  $\frac{a+1}{a^2+2a+1}$
- E.  $\frac{a-2}{a^2+2a+3}$

6. Solve for  $x$ . Choose the answer that best describes the solution(s).

$$\sqrt{3x+1} = x-3$$

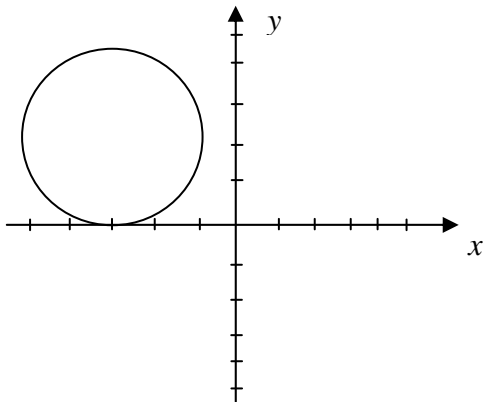
- A. There is one solution.  
It is negative.
- B. There are two solutions.  
Both are positive.
- C. There is one solution.  
It is positive.
- D. There are two solutions.  
One is positive and one is negative.
- E. There is no solution for  $x$ .

7. Find the center and radius of the circle given by

$$x^2 + y^2 - 10x + 6y - 8 = 0$$

- A.  $(5, -3)$ ; radius =  $\sqrt{42}$   
 B.  $(-5, 3)$ ; radius =  $\sqrt{8}$   
 C.  $(-5, 3)$ ; radius =  $\sqrt{42}$   
 D.  $(5, -3)$ ; radius =  $\sqrt{8}$   
 E. Not enough information given.

8. Which of the following equations represents the graph given below?



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

9. Given the equation of the line  $2x + 4y = 3$ , which of the following statements is (are) true?

- I. The  $x$ -intercept is  $\left(\frac{3}{4}, 0\right)$ .  
 II. The slope of a line perpendicular to this line is 2.  
 III. The point  $\left(1, \frac{1}{4}\right)$  is a point on this line.

- A. I and II only.  
 B. II and III only.  
 C. III only.  
 D. All are true.  
 E. None are true.

10. Solve for  $x$ .

$$x^2 + 6x + 11 = 0$$

A.  $x = -3 \pm \sqrt{2}i$

B.  $x = -3 \pm 2\sqrt{5}i$

C.  $x = -3 \pm 4\sqrt{5}i$

D.  $x = -6 \pm \sqrt{2}i$

E.  $x = -3 \pm 2\sqrt{2}i$

11. Choose the equation that would prove the fact that  $C(x, y)$  is on the perpendicular bisector of segment AB where  $A(-2, 1)$  and  $B(6, 3)$  using the distance formula.

A.  $\sqrt{(x-1)^2 + (y+2)^2} = \sqrt{(x-3)^2 + (y-6)^2}$

B.  $\sqrt{(x+2)^2 + (y-1)^2} = \sqrt{(x-6)^2 + (y-3)^2}$

C.  $\sqrt{(x-2)^2 + (y+1)^2} = \sqrt{(x+6)^2 + (y+3)^2}$

D.  $\sqrt{(x+1)^2 + (y-2)^2} = \sqrt{(x+3)^2 + (y+6)^2}$

E.  $\sqrt{x^2 + y^2} = \sqrt{(6+2)^2 + (1-3)^2}$

12. Find the domain of  $g(x) = \frac{\sqrt{x+1}}{(x-5)(x+3)}$ . Express your answer in interval notation.

A.  $[-1, \infty)$

B.  $(-\infty, -3) \cup (-3, 5) \cup (5, \infty)$

C.  $(-\infty, -3) \cup (-3, -1]$

D.  $[-1, 5) \cup (5, \infty)$

E.  $(-3, -1] \cup (5, \infty)$

13. The average age of a person when they first get married has been increasing at a constant rate (it is linear). In 1970, the average age was 20 and in 2000, it was 25 years of age. Let  $t$  represent the number of years since 1970. Express the average age in years,  $A$ , in terms of  $t$ .

A.  $A = 6t + 20$

B.  $A = \frac{1}{6}t + 20$

C.  $A = 6t - 25$

D.  $A = \frac{1}{6}t - 25$

E. None of the above

14. Sarah has decided to purchase a new vehicle. She has her eye on a new sports car or on a new SUV. The sports car costs \$21,500 and has estimated operating costs of \$1,800 per year. The SUV costs \$19,800, but operating costs are estimated to be \$2,300 per year. If  $x$  represents the number of years, choose the inequality that describes the number of years the SUV is less expensive than the sports car. Do not solve.

A.  $22,100x < 23,300x$

B.  $19,800x + 2,300 > 21,500x + 1,800$

C.  $19,800 + 2,300x > 21,500 + 1,800x$

D.  $19,800x + 2,300 < 21,500x + 1,800$

E.  $19,800 + 2,300x < 21,500 + 1,800x$

15. A square garden is to be tilled and enclosed with a fence. The cost of preparing the soil will be \$1 per square foot and the fence will cost \$3 per foot. Find the dimensions of the garden that can be tilled and enclosed for \$220.

A. 10 feet by 10 feet

B. 13 feet by 13 feet

C. 8 feet by 8 feet

D. 12 feet by 12 feet

E. None of the above