

1. Solve the following inequality for x . Express your answer in interval notation.

$$\frac{1}{4}(5 - 3x) \leq 2$$

A. $(-\infty, 1]$

B. $(-\infty, -9]$

C. $[-9, \infty)$

D. $(-\infty, -1]$

E. $[-1, \infty)$

2. Which of the following statements are true given the points $A(-1, 2)$ and $B(4, 5)$?

I. The distance between A and B is $\sqrt{34}$.

II. The slope of segment AB is $\frac{5}{3}$.

III. The midpoint of segment AB is in quadrant IV.

A. I only

B. I and II only

C. II only

D. II and III only

E. I, II, and III are true

3. Express in the form $a + bi$, where a and b are real numbers.

$$\frac{i}{3 + 4i}$$

A. $\frac{1}{3} + \frac{1}{4}i$

B. $\frac{4}{25} + \frac{3}{25}i$

C. $\frac{1}{7} + \frac{3}{7}i$

D. $-\frac{4}{7} - \frac{3}{7}i$

E. $\frac{1}{25} - \frac{3}{25}i$

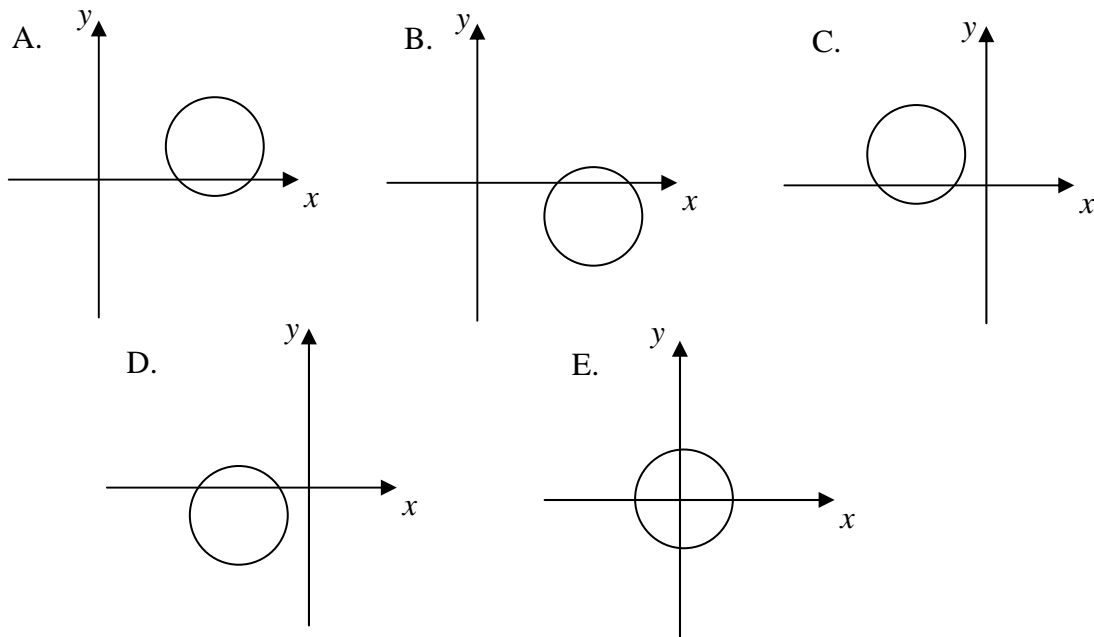
4. Choose the answer that expresses the inequality given below. Do not solve.

$$|3x + 8| \geq 7$$

- A. $-7 \leq 3x + 8 \leq 7$
- B. $3x + 8 \geq 7$
- C. $3x + 8 \geq -7$ or $3x + 8 \leq 7$
- D. $3x + 8 \leq -7$ or $3x + 8 \geq 7$
- E. None of the above

5. Which of the following depicts the graph of the equation:

$$x^2 + y^2 - 8x + 4y + 11 = 0$$



6. Find an equation of the line through the point $A(-2, 7)$ and parallel to the line given by $4x - y = 3$. Leave your answer in the form $ax + by = c$, where a , b , and c are integers and a is positive.

- A. $4x + y = -1$
- B. $4x - y = 30$
- C. $4x + y = 3$
- D. $4x - y = -15$
- E. $4x - y = 3$

7. Find the domain of the following function. Express your answer in interval notation.

$$g(x) = \frac{\sqrt{x+5}}{x^2 - 36}$$

- A. $[-5, 6) \cup (6, \infty)$
- B. $[-5, \infty)$
- C. $(-\infty, -6) \cup (-6, -5]$
- D. $(-\infty, -6) \cup (-6, 6) \cup (6, \infty)$
- E. None of the above

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

$$\sqrt{2x+7} = x+2$$

- A. There are two solutions.
One is positive and one is negative.
- B. There is one solution.
It is positive.
- C. There are two solutions.
They are both positive.
- D. There is one solution.
It is negative.
- E. There are two solutions.
They are both negative.

9. Find the slope-intercept form of a line given that the x -intercept is 3 and the y -intercept is -5 .

- A. $y = \frac{5}{3}x - 5$
- B. $y = \frac{3}{5}x + 3$
- C. $y = -\frac{5}{3}x - 5$
- D. $y = \frac{5}{3}x + 3$
- E. $y = \frac{3}{5}x - 5$

10. Which of the following statements is true if $A(-4,1)$, $B(x,y)$, $C(-2,5)$, and C is on the perpendicular bisector of segment AB ?

A. $\sqrt{(x+4)^2 + (y-1)^2} = \sqrt{52}$

B. $\sqrt{(x+2)^2 + (y-5)^2} = \sqrt{52}$

C. $\sqrt{(x+4)^2 + (y-1)^2} = \sqrt{20}$

D. $\sqrt{(x+2)^2 + (y-5)^2} = \sqrt{20}$

E. None of these are true

11. Solve for x .

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

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

B. $x = 3 \pm 4\sqrt{5}$

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

D. $x = 3 \pm 2\sqrt{5}$

E. None of the above

12. Given the function, $f(x) = x^2 - 3x + 1$, find and simplify $\frac{f(a+h) - f(a)}{h}$. Assume that $h \neq 0$.

A. $h - 3$

B. $\frac{h^2 - 6a - 3h + 2}{h}$

C. $2a + h - 3$

D. $2a - 3$

E. None of the above

13. A rectangular picture has an area of 50 square inches. The picture is surrounded by a border of uniform width. The outer dimensions (picture with the border) are 8 inches by 10 inches. If the variable x represents the width of the border, find the equation that would be used to find x . Do not solve the equation. Simplify the equation. (Hint: Draw and label a picture.)

A. $x^2 - 18x + 50 = 0$

B. $x^2 + 18x + 50 = 0$

C. $x^2 - 18x + 30 = 0$

D. $2x^2 - 18x + 15 = 0$

E. $2x^2 + 18x + 25 = 0$

14. A stone is projected upward with an initial speed of 112 ft./sec. The number of feet, s , above the ground after t seconds is given by $s = -16t^2 + 112t$. When will the stone be 160 feet above the ground?

A. $t = 1, t = 4$ seconds

B. $t = 3.5$ seconds

C. $t = 2, t = 5$ seconds

D. $t = 7$ seconds

E. Not enough information given.

15. A manufacturer sells lamps for \$6 each. At this price, he sells 3000 lamps. He wishes to raise the selling price and knows that only 1500 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 in terms of p .

A. $N = -750p + 7500$

B. $N = -\frac{1}{750}p + 10$

C. $N = -\frac{1}{750}p + 7500$

D. $N = -750p + 3000$

E. None of the above