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

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

A. $(-\infty, 1]$

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

C $[-9, \infty)$

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

E. None of the above

2. Which of the following statements are true given the points $A(3,1)$ and $B(4,-5)$?

I. The distance between
!!!! A and B is $\sqrt{37}$.

II. The slope of segment AB is -6.

III. The midpoint of segment AB is
!!!!!!!!in quadrant II.

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.

$$(6-3i)^2$$
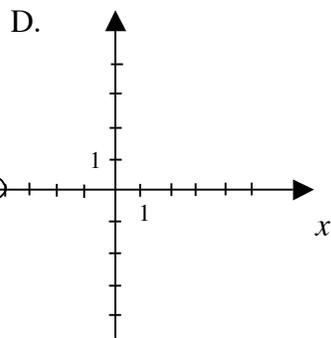
A. $27 - 36i$

B. $15 - 12i$

C. $45 - 18i$

D. $12 - 6i$

E. None of the above
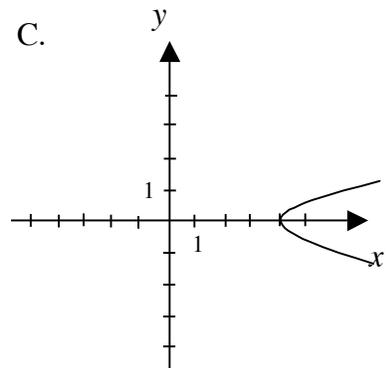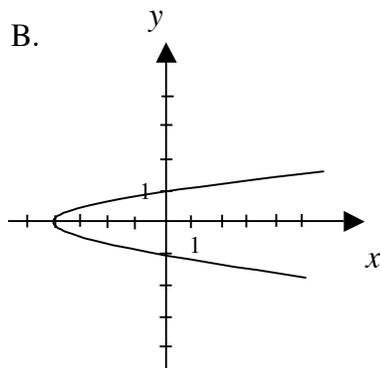
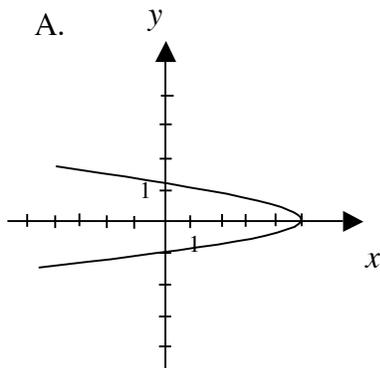4. Solve the following inequality for x. Express your answer in interval notation.

$$\left|\frac{4x+1}{3}\right| \ge 5$$

A. $(-\infty, -4] \cup \left[\frac{7}{2}, \infty\right)$

B. $\left[\frac{7}{2}, \infty\right)$

C. $\left(-\infty, -\frac{7}{2}\right] \cup [4, \infty)$

D. $\left[-4, \frac{7}{2}\right]$

E. None of the above

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

$$x = 3y^2 - 4$$

A.

B.

C.

D.

E. None of these

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 all real and complex solutions of the following equation:

$$x^4 - 81 = 0$$

A. $x = \pm 9$

B. $x = \pm 9, \quad x = \pm 9i$

C. $x = \pm 3, \quad x = \pm 3i$

D. $x = \pm 3, \quad x = \pm 9i$

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 the line having slope $\dfrac{4}{5}$ and passing through the point $(-1,3)$.

    A. $y = \dfrac{4}{5}x + \dfrac{11}{5}$

    B. $y = \dfrac{4}{5}x - 1$

    C. $y = \dfrac{4}{5}x - \dfrac{17}{5}$

    D. $y = \dfrac{4}{5}x + 3$

    E. $y = \dfrac{4}{5}x + \dfrac{19}{5}$

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. $\sqrt{(x+4)^2 + (y-1)^2} = \sqrt{20}$
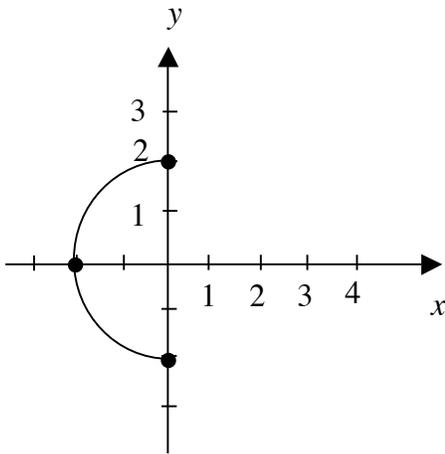
    D. $\sqrt{(x+2)^2 + (y-5)^2} = \sqrt{20}$

    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. Which of the following equations describes the graph given below:

A. $x = \sqrt{4 - y^2}$

B. $y = \sqrt{4 - x^2}$

C. $x = -\sqrt{4 - y^2}$

D. $y = -\sqrt{4 - x^2}$

E. None of the above

13. A minivan left a point at 10:00 a.m. driving due north at 40 mph. A compact car left the same point at 10:30 a.m. driving due west at 50 mph. Let x represent the number of hours past 10:00 a.m. Find the equation that would be used to find x when the vehicles are 80 miles apart.

A. $40x + 50x - 25 = 80$

B. $40x + 20 + 50x = 80$

C. $(40x)^2 + (50x)^2 = (80)^2$

D. $(40x)^2 + (50x - 25)^2 = (80)^2$

E. $(40x + 20)^2 + (50x)^2 = (80)^2$

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. None of the above

15. A swimming pool is to be in the shape of a rectangle with a semicircle at each end (see the figure). The diameter of each semicircle is 18 feet and the length of the pool is x feet. If the total area of the pool is to be 600 square feet, find x.
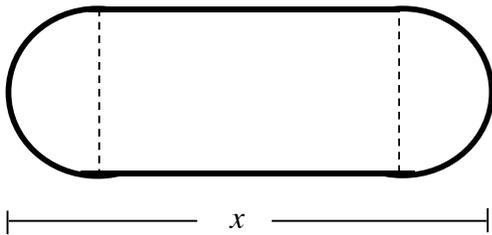
    A. 37.2 feet

    B. 19.2 feet

    C. 47.4 feet

    D. 56.4 feet

    E. None of the above