1. Given $A(-3,8)$, find the coordinates of point *B* such that $M(5,9)$ is the midpoint of $\overline{AB}$.

A. $B\left(1,\frac{17}{2}\right)$

B. $B(14,11)$

C. $B(10,9)$

D. $B(7,10)$

E. None of the above.

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

$$\frac{1}{2} \le -\frac{1}{3}(x-6) \le 4$$

A. $\left[\frac{1}{2},1\right]$

B. $\left[-6,\frac{9}{2}\right]$

C. $\left[-1,-\frac{1}{2}\right]$

D. $\left[-\frac{9}{2},6\right]$

E. None of the above.

3. Perform the indicated operation and express in the form $a+bi$, where *a* and *b* are real numbers.

$$\frac{1+2i}{4-i}$$

A. $\frac{1}{4}+2i$

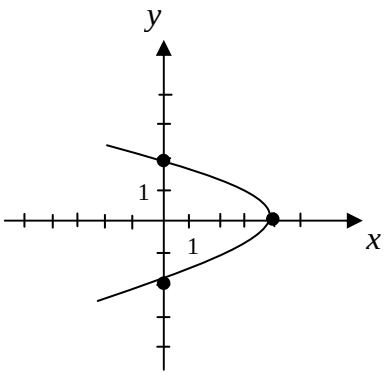
B. $\frac{6}{17}+\frac{7}{17}i$

C. $\frac{1}{4}-2i$

D. $\frac{2}{17}+\frac{9}{17}i$

E. $\frac{6}{15}+\frac{9}{15}i$

4. Choose the equation that most resembles the graph given below.



A. $x = 4 - y$

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

C. $y = 4 - x^2$

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

E. $x = 4 - y^2$

5. Solve for x. Simplify your answer.

$(x + 9)^2 = 18$

A. $x = -9 \pm 3\sqrt{2}$

B. $x = -63, \quad x = 81$

C. $x = -9 \pm 3\sqrt{3}$

D. $x = -9 \pm 2\sqrt{3}$

E. There is no solution for *x*.

6. Solve the following inequality. Express your answer using interval notation.

$|3x - 7| \geq 10$

A. $\left[-1, \frac{17}{3}\right]$

B. $\left(-\infty, -\frac{17}{3}\right] \cup [1, \infty)$

C. $(-\infty, -1] \cup \left[\frac{17}{3}, \infty\right)$

D. $\left[\frac{17}{3}, \infty\right)$

E. None of the above.

7. Find the general equation of the line through the point $A(3,-6)$ and perpendicular to the line given by $y=\frac{3}{2}x-5$.

A. $3x-2y=21$

B. $2x+3y=-3$

C. $2x-3y=-24$

D. $2x+3y=-12$

E. $3x-2y=-28$

8. Which of the following statements are true about the line given by $5x-2y=8$?

I. The $x-$intercept is $\left(\frac{8}{5},0\right)$.

II. The slope of a line parallel to the line is $\frac{2}{5}$.

III. The $y-$intercept is $(0,4)$.

A. I only.

B. I and II only.

C. II only.

D. I, II, and III.

E. None are true.

9. Find the equation of the circle with center $C(-5,3)$ and passing through the point $P(-2,4)$.

A. $(x-5)^2+(y+3)^2=10$

B. $(x+5)^2+(y-3)^2=10$

C. $(x+5)^2+(y-3)^2=98$

D. $(x-5)^2+(y+3)^2=98$

E. None of the above.

10. Solve for x: $x(2x+3)=-5$

A. $x=-\frac{5}{2},\ x=1$

B. $x=-\frac{3}{2}\pm\frac{\sqrt{7}}{2}i$

C. $x=-\frac{3}{4}\pm\frac{\sqrt{37}}{4}i$

D. $x=-5,\ x=-4$

E. $x=-\frac{3}{4}\pm\frac{\sqrt{31}}{4}i$

11. Find all solutions of $x^4+7x^2-18=0$

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

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

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

D. $x=-9,\ x=2$

E. There are no solutions for x.

12. Choose the simplified equation that would solve the following:

Find the point with coordinates of the form $(a,2a)$ that is in the first quadrant and is a distance $\sqrt{29}$ from the point $P(-2,4)$

A. $5a^2+9=0$

B. $5a^2-12a-9=0$

C. $5a^2+12a+9=0$

D. $5a^2-9=0$

E. Cannot be determined.

13. A bottle rocket was fired upward with an initial speed of 80 ft/sec. The number of feet, *s*, above the ground after *t* seconds is given by $s = -16t^2 + 80t$. When will the rocket hit the ground?

A. 4.5 seconds

B. 3 seconds

C. 5 seconds

D. 4 seconds

E. Cannot be determined.

14. A conical cup is to have a radius of 2 inches. Find the height of the cup that will result in a surface area of 12π square inches. The surface area of a conical cup is given by $\pi r\sqrt{r^2 + h^2}$.

A. $2\sqrt{7}$ inches

B. $4\sqrt{2}$ inches

C. $2\sqrt{35}$ inches

D. $4\sqrt{35}$ inches

E. $5\sqrt{7}$ inches

15. The number of households connected to the Internet has been increasing at a constant rate (it is linear). In 1995, there were approximately 9 million homes connected. This number climbed to about 51 million in 2001. If *t* represents the number of years since 1995 ($t = 0$ is the year 1995) and *H* represents the number of households connected to the Internet (in millions), express *H* in terms of *t*.

A. $H = 7t + 9$

B. $H = \frac{1}{7}t + 9$

C. $H = 7t + 51$

D. $H = \frac{1}{7}t + 51$

E. None of the above.