1. Given the point $A(-4,1)$, find the coordinates of the point B such that $M(5,-2)$ is the midpoint of segment AB.

    A. $(15, -6)$

    B. $(3, 4)$

    C. $(14, -5)$

    D. $\left(\dfrac{1}{2}, -\dfrac{1}{2}\right)$

    E. None of the above

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

$$\left(5 - \sqrt{-9}\right)(2 + i)$$

    A. $13 - i$

    B. $4 + 2i$

    C. $7 - i$

    D. $16 + 8i$

    E. None of the above

3. Find the real solution(s) of the following equation. Choose the answer that best describes the solution(s).

$$x^{\frac{3}{5}} = -8$$

    A. x is greater than 5

    B. x is between 0 and 5

    C. x is between -5 and 0

    D. x is less than -5

    E. There are no real solutions

4. Temperature readings on the Fahrenheit (F) and Celsius (C) scales are related by the formula $C = \dfrac{5}{9}(F - 32)$. What values of F correspond to the values of C such that $15 < C < 50$?

    A. $84.6 < F < 147.6$

    B. $59.0 < F < 122.0$

    C. $26.1 < F < 45.6$

    D. $40.3 < F < 77.6$

    E. None of the above

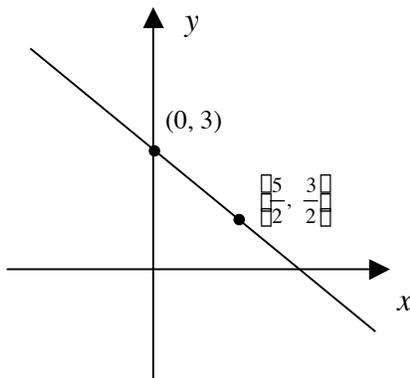5. Solve the following inequality. Express your answer in interval notation.

$$8x - 5 \geq 6(3x + 4)$$

A. $\left(-\infty, -\dfrac{19}{10}\right]$

B. $\left[-\dfrac{29}{10}, \infty\right)$

C. $\left[-\dfrac{19}{10}, \infty\right)$

D. $\left(-\infty, -\dfrac{29}{10}\right]$

E. None of the above

6. Find an equation for the circle that has center $C(-6,2)$ and passes through the point $P(5,-4)$.

A. $(x + 6)^2 + (y - 2)^2 = 157$

B. $(x - 6)^2 + (y + 2)^2 = 5$

C. $(x + 6)^2 + (y + 2)^2 = 5$

D. $(x - 6)^2 + (y + 2)^2 = 157$

E. None of the above

7. Which of the following equations corresponds to the graph given below?

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

B. $y = -\dfrac{1}{2}x + 3$

C. $y = -\dfrac{3}{5}x + 3$

D. $y = \dfrac{9}{5}x + 3$

E. $y = -x + 3$

8. Solve the following inequality. Express your answer in interval notation.

$$\left(x^2 - 9\right)(x + 4) > 0$$

A. $\left(-4, \infty\right)$

B. $\left(3, \infty\right)$

C. $\left(-\infty, -4\right) \cup \left(-3, 3\right)$

D. $\left(-4, -3\right) \cup \left(3, \infty\right)$

E. None of the above

9. Find an equation of the line that passes through the point $A(2, -1)$ and is perpendicular to the line $y = \dfrac{3}{4}x - 7$. Leave your answer in the form $ax + by = c$, where a, b, and c are integers and a is positive.

A. $4x - 3y = 11$

B. $4x + 3y = -21$

C. $4x - 3y = 7$

D. $4x + 3y = 2$

E. $4x + 3y = 5$

10. Solve for x. Simplify your answer completely.

$$3x^2 + 4x + 5 = 0$$

A. $x = -5, \ x = -3$

B. $x = -\dfrac{2}{3} \pm \dfrac{2\sqrt{11}}{3}i$

C. $x = -\dfrac{2}{3} \pm \dfrac{1}{3}i$

D. $x = 2 \pm 2\sqrt{11}i$

E. $x = -\dfrac{2}{3} \pm \dfrac{\sqrt{11}}{3}i$

11. Find the equation that would be used to find the points with coordinates of the form $(a,\ 2a)$ that are a distance 58 from the point $P(4,3)$. Do not solve the equation.

        A. $\sqrt{(a+4)^2 + (2a+3)^2} = 58$

        B. $(a-4) + (2a-3) = 58$

        C. $(a+4) + (2a+3) = 58$

        D. $\sqrt{(a-4)^2 + (2a-3)^2} = 58$

        E. None of the above

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

$$\sqrt{2x+40} + 4 = x$$

        A. There are two solutions.
            One is positive and one is negative.

        B. There is one solution.
            It is greater than 10.

        C. There is one solution.
            It is less than -10.

        D. There is one solution.
            It is between -10 and 10.

        E. There are no solutions.

13. A can is to be made in the shape of a right circular cylinder. The height of the can is to be 5 inches and the volume is to be 1025 cubic inches. Find the radius, r, of the can. Round your answer to one decimal place. (Volume of a right circular cylinder $= \pi r^2 h$.)

        A. 14.3 inches

        B. 32.6 inches

        C. 8.1 inches

        D. 13.1 inches

        E. None of the above

14. 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.

              $A.\ N = -750p + 7500$

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

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

              $D.\ N = -750p + 3000$

              $E.$ None of the above

15. A 28-by-32- inch sheet of paper is to be used for a poster with the shorter side at the bottom. The margins at the sides and bottom are to have the same width. The margin at the top is to be three times as wide as the other margins. The area of the printed portion is to be 576 square inches. Find the width of the top margin.

              $A.$ 3 inches

              $B.$ 6 inches

              $C.$ 8 inches

              $D.$ 14 inches

              $E.$ There is no solution.