

## Quadratics (Basic)

- What are the solutions of the quadratic equation  $x^2 - x - 6 = 0$  ?
  - $x = 2$  and  $x = -3$
  - $x = 2$  and  $x = 3$
  - $x = -2$  and  $x = -3$
  - $x = -2$  and  $x = 3$
  - $x = 6$  and  $x = -1$
- Marcus has a tutoring company, Smart Enterprises, and he estimates that if the company makes its hourly rate  $d$  dollars, then its weekly profit  $p$  can be modeled by the function  $p(d) = 1,000d - 5d^2$ , where  $0 \leq d \leq 200$ . According to the model, for which of the following values of  $d$  will the weekly profit of this product be the largest?
  - 5
  - 100
  - 1,000
  - 5,000
  - 50,000
- In the  $xy$  plane, what are the coordinates of the vertex of the parabola with equation  $y = 3(x - 5)^2 + 6$ ?
  - $(-6, -5)$
  - $(-6, 5)$
  - $(-5, -6)$
  - $(5, -6)$
  - $(5, 6)$
- Which of the following expressions is equal to  $(a + \sqrt{b})(a - 2\sqrt{b})$ , for all positive real numbers  $a$  and  $b$ ?
  - $a^2 - 3a\sqrt{b}$
  - $a^2 - a\sqrt{b} - 2b$
  - $a^2 - a\sqrt{b} - 2\sqrt{b}$
  - $a^2 - 3a\sqrt{b} - 2b$
  - $a^2 + 3a\sqrt{b} - 2b$

5. What are the zeroes of the quadratic equation  $x^2 + 3x - 28 = 0$  ?
- A.  $x = -4$  and  $x = -7$
  - B.  $x = -4$  and  $x = 7$
  - C.  $x = 4$  and  $x = -7$
  - D.  $x = 4$  and  $x = 7$
  - E.  $x = 14$  and  $x = -2$
6. In the  $xy$ -plane, the graph of the function  $f(x) = x^2 - 4x + 3$  has two  $x$ -intercepts. What is the distance between the  $x$ -intercepts?
- A. 1
  - B. 2
  - C. 3
  - D. 4
  - E. 5
7. What are the solutions of the quadratic equation  $12x^2 - 2x - 4 = 0$ ?
- A.  $x = \frac{2}{3}$  and  $x = -\frac{1}{2}$
  - B.  $x = \frac{1}{3}$  and  $x = -\frac{3}{2}$
  - C.  $x = -\frac{2}{3}$  and  $x = \frac{1}{2}$
  - D.  $x = -\frac{1}{3}$  and  $x = -\frac{3}{2}$
  - E.  $x = -\frac{1}{3}$  and  $x = \frac{3}{2}$

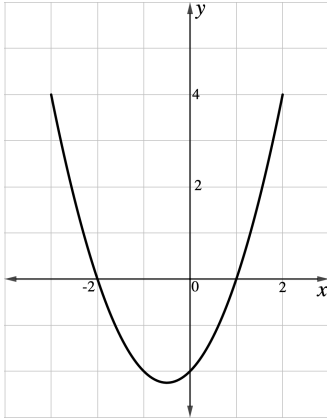
$$x^4 - 8x^2 + 16$$

8. Which of the following is equivalent to the expression above?
- A.  $(x - 2)^4$
  - B.  $(x - 4)^4$
  - C.  $(x + 2)^4$
  - D.  $(x - 2)^2(x + 2)^2$
  - E.  $(x - 4)^2(x + 4)^2$

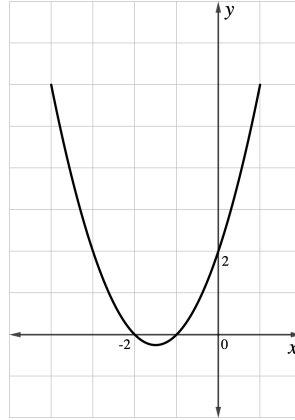
9. What are the roots of the quadratic equation  $x^4 - 4x^2 + 4 = 0$ ?
- A.  $x = -\sqrt{2}$  and  $x = \sqrt{2}$
  - B.  $x = -2$  and  $x = -\sqrt{2}$
  - C.  $x = -2$  and  $x = 2$
  - D.  $x = -2$  and  $x = \sqrt{2}$
  - E.  $x = \sqrt{2}$  and  $x = 2$
10. Which of the following is an equivalent form of the quadratic equation  $y = 5x^2 + 10x - 75$ , from which the  $x$ -intercepts can be identified as constants or coefficients in the equation?
- A.  $y = 5(x^2 + 2x - 15)$
  - B.  $y = -5(x^2 - 2x + 15)$
  - C.  $y = 5(x + 5)(x - 3)$
  - D.  $y = 5(x - 5)(x + 3)$
  - E.  $y = 5(x + 1)^2 - 80$
11. In the standard  $(x, y)$  coordinate plane, the equation  $y = -2(x + 4)^2 + 2$  intersects the  $x$ -axis at points  $(-5, 0)$  and  $(a, 0)$ . What is the value of  $a$ ?
- A.  $-3$
  - B.  $-2$
  - C.  $-1$
  - D.  $2$
  - E.  $4$
12. What are the solutions to  $2x^2 + 12x + 8 = 0$ ?
- A.  $x = -12 \pm 4\sqrt{5}$
  - B.  $x = -6 \pm 2\sqrt{5}$
  - C.  $x = -6 \pm 2\sqrt{13}$
  - D.  $x = -3 \pm \sqrt{5}$
  - E.  $x = -3 \pm \sqrt{13}$

13. Which of the following could be the graph of  $y = x^2 - 3x + 2$ ?

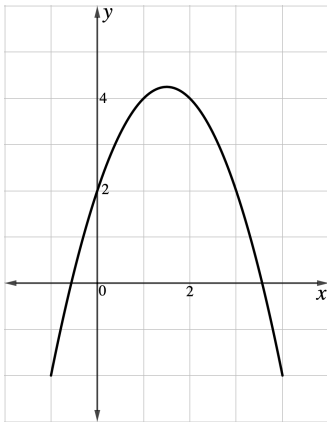
**A.**



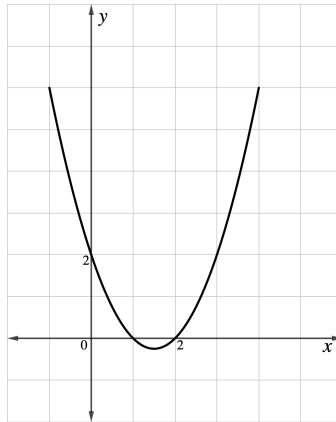
**D.**



**B.**



**E.**



**C.**

