Date Completed: _____
Mentor Initials: _____

Quadratics (Basic)

1. What are the solutions of the quadratic equation $x^2 - x - 6 = 0$?

A. $x = 2$ and $x = -3$
B. $x = 2$ and $x = 3$
C. $x = -2$ and $x = -3$
D. $x = -2$ and $x = 3$
E. $x = 6$ and $x = -1$

2. 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?

A. 5
B. 100
C. 1,000
D. 5,000
E. 50,000

3. In the xy plane, what are the coordinates of the vertex of the parabola with equation $y = 3(x - 5)^2 + 6$?

A. $(-6, -5)$
B. $(-6, \ 5)$
C. $(-5, -6)$
D. $(\ 5, -6)$
E. $(\ 5, \ 6)$

4. Which of the following expressions is equal to $(a + \sqrt{b})(a - 2\sqrt{b})$, for all positive real numbers a and b?

A. $a^2 - 3a\sqrt{b}$
B. $a^2 - a\sqrt{b} - 2b$
C. $a^2 - a\sqrt{b} - 2\sqrt{b}$
D. $a^2 - 3a\sqrt{b} - 2b$
E. $a^2 + 3a\sqrt{b} - 2b$

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?

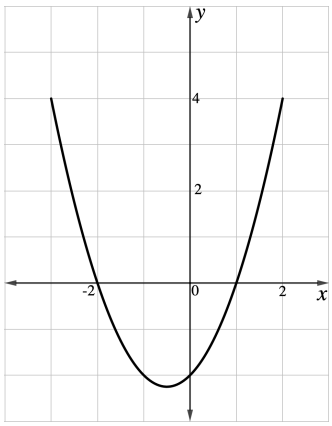
A. -3
B. -2
C. -1
D. 2
E. 4

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.



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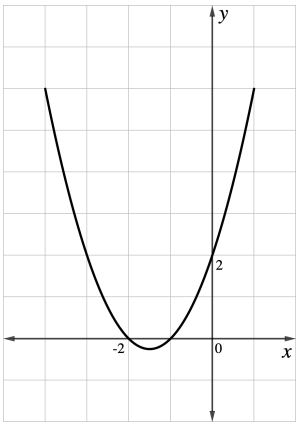
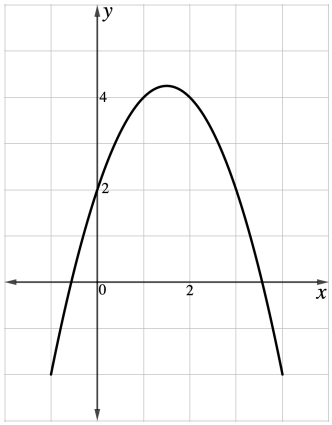
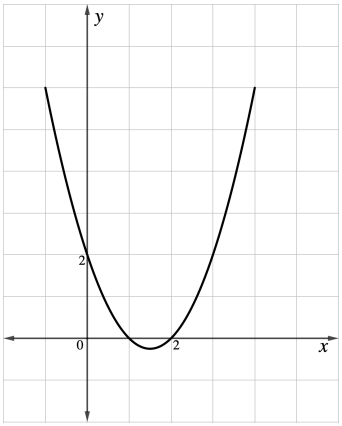


B.



E.



C.