

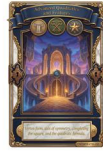
Advanced Quadratics and Features

Vertex form, axis of symmetry, completing the square, and the quadratic formula.

Name _____ Date _____

32 main 2-up grid 11 pages visible side quests

Completion Reward



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1. What is the vertex of $y = (x - 2)^2 + 5$?

- A. (-2, 5)
- B. (2, -5)
- C. (-2, -5)
- D. (2, 5)

1.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

1.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

1.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

1.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

1.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

2. Which formula solves $ax^2 + bx + c = 0$?

- A. $x = b^2 - 4ac$
- B. $x = (-b \pm \sqrt{b^2 - 4ac}) / (2a)$
- C. $x = -b / a$
- D. $x = a^2 + b^2$

2.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

2.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

2.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

2.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

2.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

3. What line passes through the middle of a parabola?

- A. Axis of symmetry
- B. y-intercept
- C. secant line
- D. directrix

3.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

3.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

3.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

3.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

3.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

4. What is the vertex of $y = (x + 3)^2 - 1$?

- A. (3, -1)
- B. (-3, 1)
- C. (3, 1)
- D. (-3, -1)

4.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

4.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

4.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

4.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

4.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

5. A student solves $x^2 = 25$ and writes $x = 5$. What is missing?

- A. They forgot to square both sides again.
- B. They should have written $x = 0$.
- C. They forgot the negative solution $x = -5$.
- D. Nothing is missing because 5 is the only solution.

5.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

5.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

5.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

5.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

5.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

6. Solve $x^2 = 49$.

- A. $x = -7$ or $x = 7$
- B. $x = 7$ only
- C. $x = -7$ only
- D. No real solution

6.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

6.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

6.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

6.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

6.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

7. For $x^2 + 4x + 10 = 0$, what does the discriminant say?

- A. There are two different real solutions.
- B. There is one repeated real solution.
- C. There are no real solutions.
- D. The equation must be linear.

7.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

7.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

7.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

7.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

7.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

8. How many real solutions does $x^2 + 4 = 0$ have?

- A. One real solution
- B. Two real solutions
- C. No real solutions
- D. Infinitely many real solutions

8.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

8.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

8.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

8.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

8.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

9. What is the axis of symmetry of $y = x^2 - 6x + 5$?

- A. $x = 3$
- B. $x = -3$
- C. $y = 3$
- D. $x = 6$

9.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

9.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

9.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

9.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

9.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

10. For $y = -2(x + 1)^2 + 3$, what is the maximum value?

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

10.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

10.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

10.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

10.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

10.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

11. What is the vertex of $y = (x - 2)^2 + 7$?

- A. (-2, 7)
- B. (2, 7)
- C. (2, -7)
- D. (7, 2)

11.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

11.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

11.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

11.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

11.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

12. How does the graph of $y = -2(x - 1)^2 + 4$ open?

- A. Downward
- B. Upward
- C. Left
- D. Right

12.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

12.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

12.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

12.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

12.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

13. A parabola has x-intercepts at 1 and 5. What is its axis of symmetry?

- A. $x = 3$
- B. $x = 2$
- C. $x = 4$
- D. $x = 6$

13.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

13.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

13.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

13.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

13.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

14. What is the best first step to complete the square for $x^2 + 8x + 3$?

- A. Square 8 directly.
- B. Multiply 8 and 3.
- C. Set the expression equal to 0 first no matter what.
- D. Take half of 8 and square it.

14.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

14.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

14.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

14.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

14.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

15. What is the best next step to solve $x^2 + 6x = 7$ by completing the square?

- A. Add 6 to both sides.
- B. Multiply both sides by 2.
- C. Factor the left side as $(x + 6)^2$.
- D. Add 9 to both sides.

15.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

15.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

15.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

15.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

15.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

16. A student adds 4 to the left side of $x^2 + 4x = 5$ but not to the right side. What is the problem?

- A. Completing the square must keep the equation balanced by adding the same amount to both sides.
- B. You should subtract 4 from the left side instead.
- C. Quadratics should never be rewritten as perfect squares.
- D. The student should have divided by 4 first.

16.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

17. A student says the vertex of $y = (x - 5)^2 + 2$ is (-5, 2). What is the mistake?

- A. The y-value should always be negative.
- B. In vertex form, $x - 5$ means $h = 5$, not -5.
- C. The square should be distributed first.
- D. The vertex is always on the y-axis.

17.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

18. Solve $x^2 - 5x + 6 = 0$.

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

18.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

16.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

16.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

17.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

17.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

18.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

18.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

16.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

16.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

17.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

17.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

18.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

18.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

19. Which quadratic has roots -1 and 4?

- A. $(x + 1)(x - 4)$
- B. $(x - 1)(x + 4)$
- C. $(x + 1)(x + 4)$
- D. $(x - 1)(x - 4)$

19.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

20. Find the axis of symmetry of $y = x^2 - 6x + 5$.
Answer with your final expression.

20.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

21. For $y = x^2 - 6x + 5$, what is the y-value of the vertex? Answer with a number.

21.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

19.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

19.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

20.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

20.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

21.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

21.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

19.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

19.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

20.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

20.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

21.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

21.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

22. Rewrite $x^2 + 4x + 1$ in vertex form. Answer as an equation.

22.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

22.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

22.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

22.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

22.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

23. Solve $x^2 - 5x + 6 = 0$. Answer with all solution values of x .

23.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

23.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

23.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

23.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

23.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

24. Rewrite $x^2 + 8x + 6$ in completed-square form. Answer as an equation.

24.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

24.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

24.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

24.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

24.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

25. What is the maximum value of $y = -3(x + 1)^2 + 5$? Answer with a number.

25.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

25.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

25.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

25.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

25.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

26. Find the x-intercepts of $y = (x - 4)(x + 1)$. Answer with your final expression.

26.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

26.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

26.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

26.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

26.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

27. After completing the square, which equation comes from $x^2 + 4x = 5$?

- A. $(x + 4)^2 = 21$
- B. $(x + 2)^2 = 9$
- C. $(x + 2)^2 = 5$
- D. $(x + 4)^2 = 9$

27.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

27.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

27.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

27.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

27.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

28. What is the most efficient method to solve $x^2 - 16 = 0$?

- A. Use the quadratic formula first.
- B. Use square roots.
- C. Graph it and guess.
- D. There is no efficient method.

28.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

28.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

28.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

28.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

28.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

29. What are the solutions of $x^2 - 2x - 3 = 0$?

- A. $x = -1$ or $x = 3$
- B. $x = 1$ or $x = -3$
- C. $x = -1$ only
- D. $x = 3$ only

29.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

29.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

29.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

29.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

29.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

30. Solve $x^2 - 6x + 9 = 0$. Answer in the form $x = \dots$

- A. $x = -1$ or $x = 3$
- B. $x = 1$ or $x = -3$
- C. $x = -1$ only
- D. $x = 3$ only

30.1. If a quadratic has a positive leading coefficient, the parabola opens:

- A. down
- B. left
- C. right
- D. up

30.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

30.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

30.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

30.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

31. Solve $x^2 + 4x + 10 = 0$. Answer in the form $x =$
...

31.1. If a quadratic has a positive leading coefficient,
the parabola opens:

- A. down
- B. left
- C. right
- D. up

31.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

31.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

31.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

31.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$

32. Which method best reveals the vertex of $y = x^2 - 4x + 1$?

- A. Only factor it.
- B. Only look at the y-intercept.
- C. Rewrite in vertex form by completing the square.
- D. Turn it into a linear equation first.

32.1. If a quadratic has a positive leading coefficient,
the parabola opens:

- A. down
- B. left
- C. right
- D. up

32.2. Which factorization matches $x^2 + 5x + 6$?

- A. $(x + 2)(x + 3)$
- B. $(x - 2)(x - 3)$
- C. $(x + 1)(x + 6)$
- D. $(x - 1)(x - 6)$

32.3. What is the vertex of $y = (x - 4)^2 + 1$?

- A. (4, 1)
- B. (-4, 1)
- C. (4, -1)
- D. (1, 4)

32.4. What is the axis of symmetry of $y = (x + 3)^2 - 2$?

- A. $x = -3$
- B. $x = 3$
- C. $y = -2$
- D. $y = 3$

32.5. If $(x - 5)(x + 2) = 0$, one solution is:

- A. $x = 5$
- B. $x = 7$
- C. $x = -7$
- D. $x = 10$