

Directions: Please choose the best answer choice for each of the following questions.

1. What is the greatest common factor of the terms of $36x^4 - 4xy$?
- A. $2x$
 - B. $2x^4$
 - C. $4x$
 - D. $4x^4$

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. Correct
- D. No rationale available

ItemID A2KC.1134301
 Correct C
 Standard(s) MA.9-12.MA.912.A.4.3

2. What is the complete factorization of $a^2 - 7a - 18$?
- A. $(a + 9)(a - 2)$
 - B. $(a - 9)(a - 2)$
 - C. $(a + 9)(a + 2)$
 - D. $(a - 9)(a + 2)$

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. No rationale available
- D. Correct

ItemID A2KC.1132189
 Correct D
 Standard(s) MA.9-12.MA.912.A.4.3

3. The bulletin board in Ms. Harper's classroom has an area of $x^2 - 16$ square feet. Which are possible dimensions of the bulletin board?
- A. $(x + 4)$ by $(x - 4)$
 - B. $(x - 4)$ by $(x - 4)$
 - C. $(x + 2)$ by $(x - 8)$
 - D. $(x - 2)$ by $(x + 8)$

Answer Choice Rationale

- A. Correct answer.

- B. If these were the dimensions, the area would be $x^2 - 8x + 16$.
- C. If these were the dimensions, the area would be $x^2 - 6x - 16$.
- D. If these were the dimensions, the area would be $x^2 + 6x - 16$.

ItemID A2K.1014118
 Correct A
 Standard(s) MA.9-12.MA.912.A.4.3

4. What is the factored form of $x^2 - 16x + 64$?
- A. $(x - 8)^2$
 - B. $(x + 8)^2$
 - C. $(x + 8)(x - 8)$
 - D. $(x - 4)(x - 16)$

Answer Choice Rationale

- A. Correct
- B. No rationale available
- C. No rationale available
- D. No rationale available

ItemID A2KC.1132204
 Correct A
 Standard(s) MA.9-12.MA.912.A.4.3

5. Factor.
- $2x^2 + 7x - 4$
- A. $(x - 1)(2x + 4)$
 - B. $(x + 1)(2x - 4)$
 - C. $(2x + 1)(x - 4)$
 - D. $(2x - 1)(x + 4)$

Answer Choice Rationale

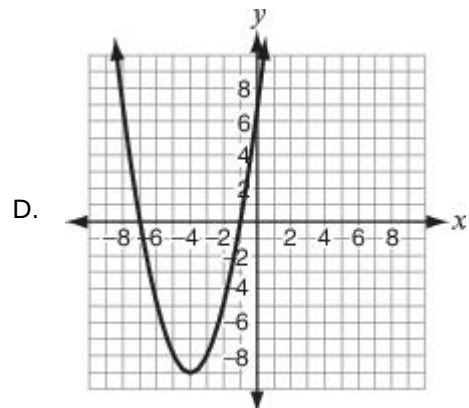
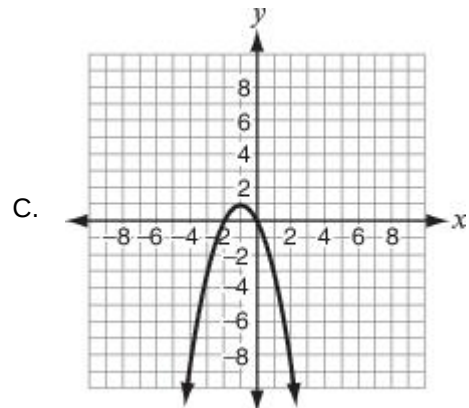
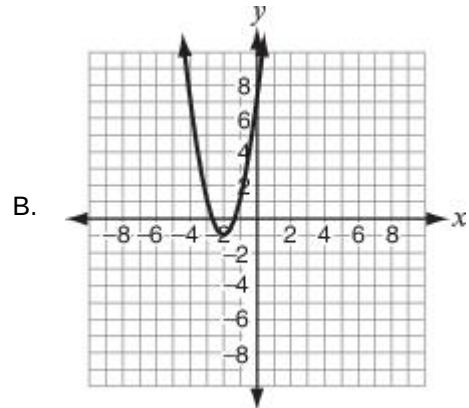
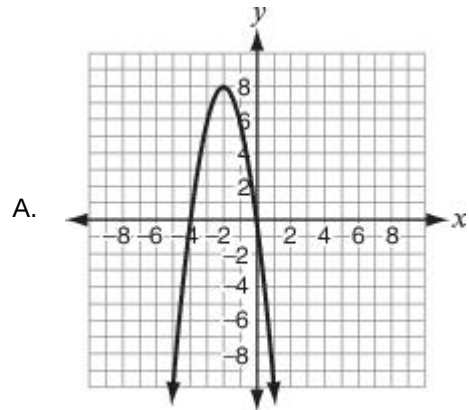
- A. This answer uses the 2 in the wrong factor.
- B. This answer reverses the signs in the two factors and uses the 2 in the wrong factor.
- C. This answer reverses the signs in the two factors.

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D. Correct answer

ItemID A2K.1021248
 Correct D
 Standard(s) MA.9-12.MA.912.A.4.3

6. Mr. Henderson asked four students to graph the function $f(x) = x^2 + 8x + 7$. Which student graph is correct?



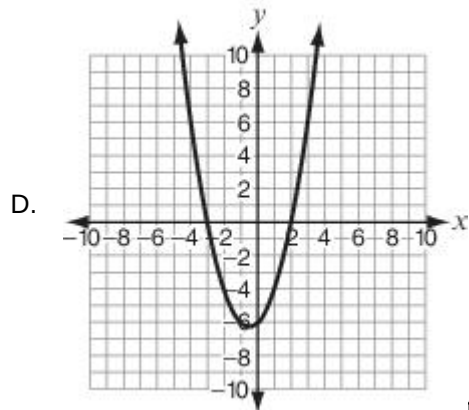
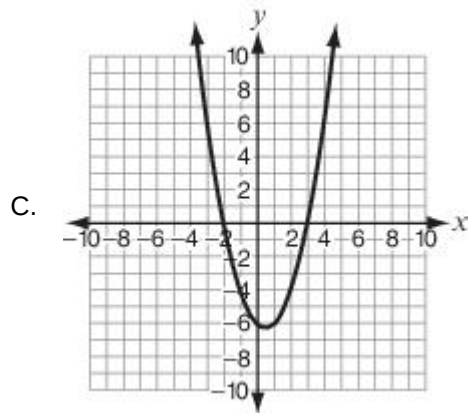
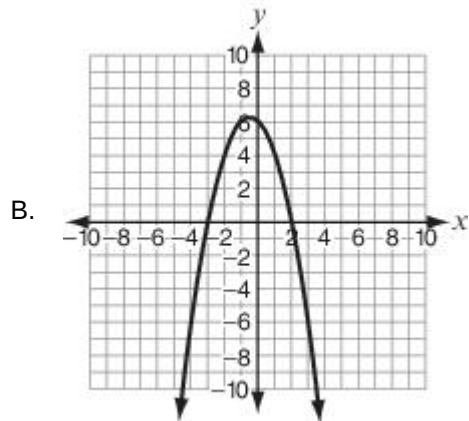
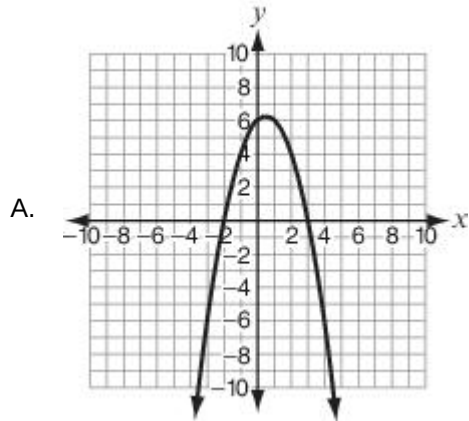
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Answer Choice Rationale

- Since the coefficient a , or 1, is positive, the sides of the graph should rise upward from the vertex.
- A. The vertex is not located at $(-4, 9)$, and the x -intercepts are not -7 and -1 .
 - B. The vertex of the function is located at $(-2, -1)$ not at $(-4, -9)$.
The y -intercept for the function is located at $(1, 1)$ not at $(-4, -9)$. However, the point $(-1, 1)$ is on the graph of the function, and this might make the choice attractive. Because the coefficient a , or 1, is positive, the graph should open up and not down.
 - C. Correct answer.

ItemID A2K.1019971
 Correct D
 Standard(s) MA.9-12.MA.912.A.7.1

7. Which parabola represents the correct roots and vertex for the equation, $y = -x^2 + x + 6$?

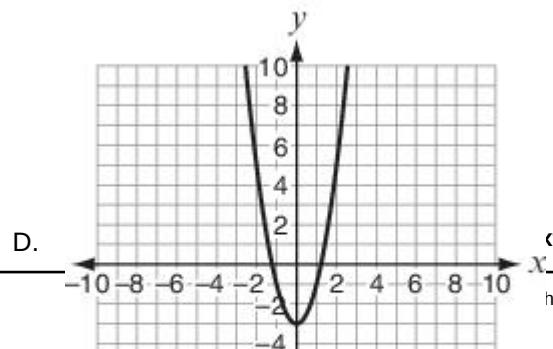
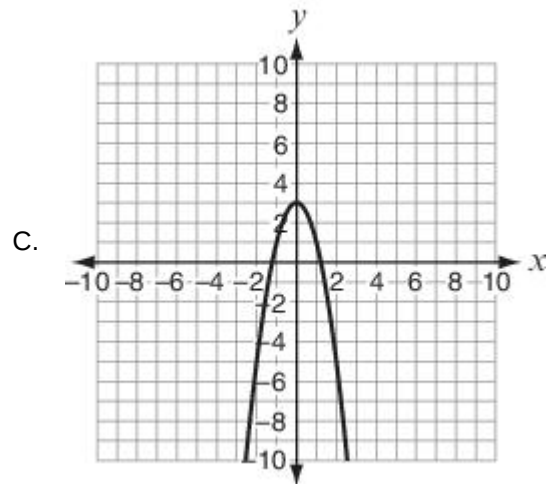
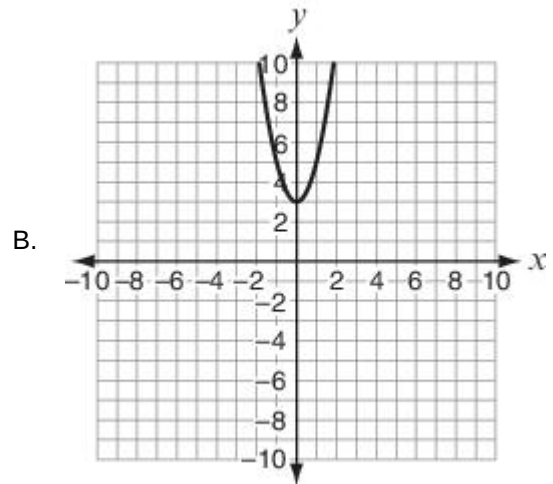
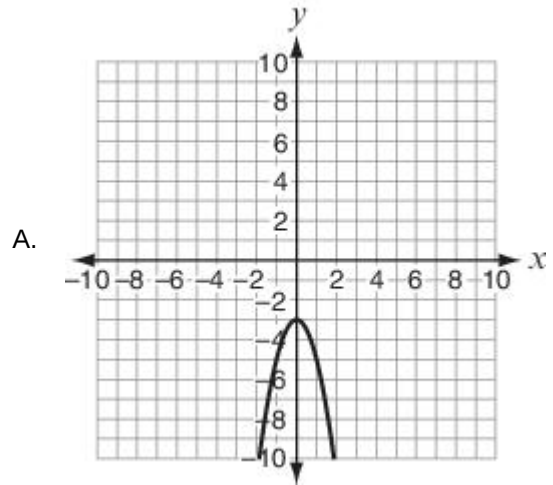


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Answer Choice Rationale

- A. Correct answer.
The student gets confused with negative and positive signs while factoring. So, he/she gets incorrect roots for the equation but identifies the correct vertex.
- B. The student reverses the negative coefficient of y , which is -1 , and goes on to represent the graph in the form $f(x)$ instead of $-f(x)$. Then, he/she finds the wrong vertex on the y -axis.
- C. The student reverses the negative and positive signs while factoring, getting incorrect roots for the equation and an incorrect vertex.
- D.

8. Which graph represents the equation $y = -2x^2 + 3$?



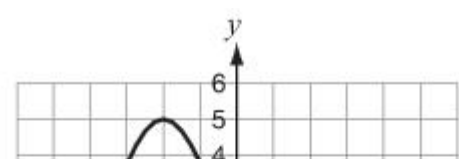
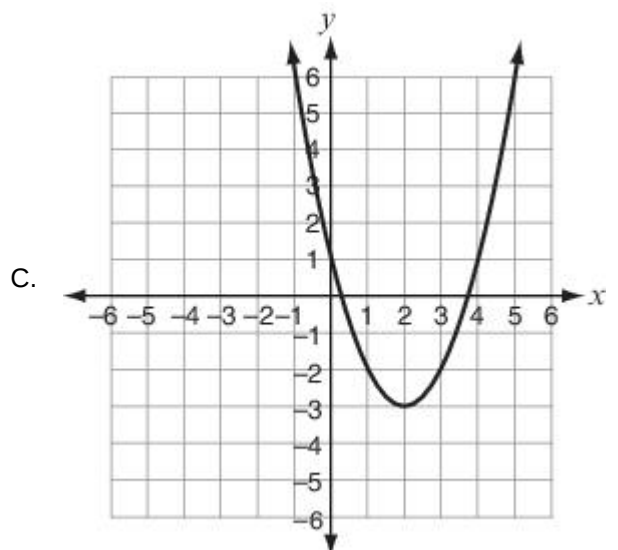
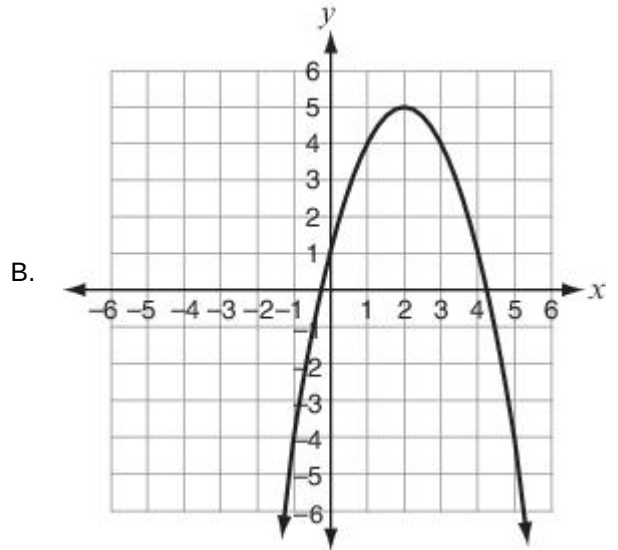
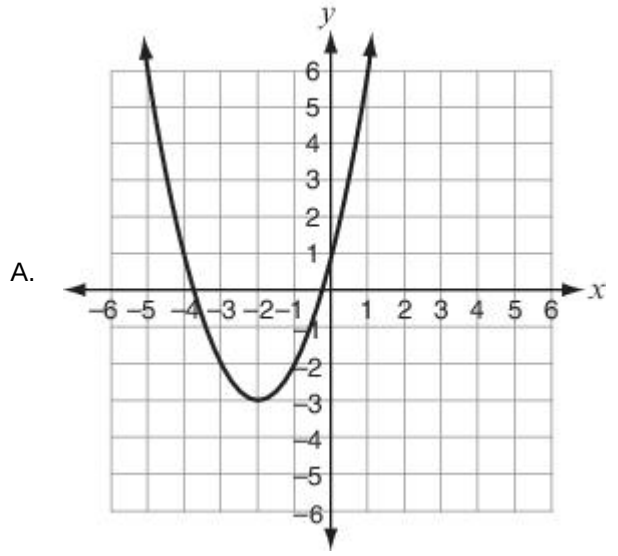
ItemID A2K.1221769
 Correct A
 Standard(s) MA.9-12.MA.912.A.7.1

Answer Choice Rationale

- A. This is the graph of $y = -2x^2 - 3$.
- B. This is the graph of $y = 2x^2 + 3$.
- C. Correct answer
- D. This is the graph of $y = 2x^2 - 3$.

ItemID A2K.1303548
 Correct C
 Standard(s) MA.9-12.MA.912.A.7.1

9. Which graph represents the function $y = -x^2 - 4x + 1$?



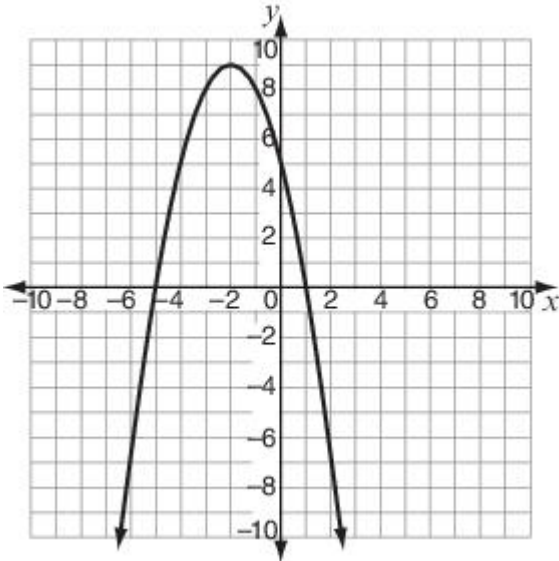
Answer Choice Rationale

- This graph has the correct x-intercepts and
- A. y-intercept, but opens upwards instead of downwards.
 - B. This graph opens upwards and has the correct y-intercept, but does not have the correct x-intercepts.

- This graph has the correct y-intercept, but does
- C. not have the correct x-intercepts and opens upwards instead of downwards.
 - D. Correct answer.

ItemID A2K.1013539
 Correct D
 Standard(s) MA.9-12.MA.912.A.7.1

10. A quadratic function is graphed below.



Which quadratic function is represented in this graph?

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

Answer Choice Rationale

- This quadratic function would have a y-
- A. intercept of 5, but would open upward instead of downward.
 - B. This quadratic function would open upward instead of downward and would not have x-intercepts of -5 and 1.
 - C. This quadratic function opens downward, but does not have the correct vertex or x-intercepts.
 - D. Correct answer.

ItemID A2K.1066561
 Correct D
 Standard(s) MA.9-12.MA.912.A.7.1

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11. What is the solution set of $x^2 = 25$?

- A. {5}
- B. {-5}
- C. {-5, 5}
- D. {}

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. Correct
- D. No rationale available

ItemID A2KC.1132228
 Correct C
 Standard(s) MA.9-12.MA.912.A.7.2

12. What is the solution of $x^2 - 9 = 0$?

- A. 3 only
- B. -3 only
- C. 3 and -3
- D. 3 and 0

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. Correct
- D. No rationale available

ItemID A2KC.1132234
 Correct C
 Standard(s) MA.9-12.MA.912.A.7.2

13. Which quadratic equation has 4 as its only root?

- A. $y = x^2 - 16$
- B. $y = x^2 + 16$
- C. $y = x^2 - 8x + 16$
- D. $y = x^2 + 8x + 16$

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. Correct

D. No rationale available

ItemID A2KC.1087407
 Correct C
 Standard(s) MA.9-12.MA.912.A.7.2

14. What is the sum of the zeros of the following equation?

$$x^2 + 3x - 18 = 0$$

- A. -14
- B. -3
- C. 3
- D. 7

Answer Choice Rationale

- A. The student assumed the 'sum of the zeros' meant 'sum of the coefficients'.
- B. Correct answer.
The student factored the expression correctly, but did not set each factor equal to zero and solve for the zeros of the equation. The student instead looked at the factored form $(x + 6)(x - 3)$ and added 6 and -3.
The student understood to factor the expression, solve for the zeros and then add them, but
- C. The student understood to factor the expression, solve for the zeros and then add them, but factored incorrectly which led to an incorrect answer. The student factored $x^2 + 3x - 18$ as $(x - 9)(x + 2)$.
- D.

ItemID A2K.1144096
 Correct B
 Standard(s) MA.9-12.MA.912.A.7.2

15. Find the solutions to the quadratic equation.

$$x^2 + 3x = -2$$

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

Answer Choice Rationale

- A. Correct answer.
- B. This answer factors the equation to $(x + 2)(x - 1) = 0$ instead of $(x + 2)(x + 1) = 0$.
- C. This answer factors the equation to $(x + 1)(x - 2) = 0$ instead of $(x + 2)(x + 1) = 0$.

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- D. This answer factors the equation to $(x - 2)(x - 1) = 0$ instead of $(x + 2)(x + 1) = 0$.

ItemID A2K.1021442

Correct A

Standard(s) MA.9-12.MA.912.A.7.2

Stop! You have finished this exam.