> **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. $4x^4$

2. What is the greatest common factor of the terms of $10x^2y^3 - 25xy^4 + 40x^3y^2$ ?

   A. $5$

   B. $5xy^2$

   C. $5x^2y^2$

   D. $10xy^2$

3. What is the complete factorization of $3x^3 - 2x^2$ ?

   A. $x\left(3x^2 - 2\right)$

   B. $x^2(3x - 2)$

   C. $3x^2(x - 2)$

   D. It cannot be factored.

4. Factor: $x^2 + 16x + 64$

   A. $(x + 4)^2$

   B. $(x + 8)^2$

   C. $(x + 16)^2$

   D. $(x + 32)^2$

5. Factor completely.

   $x^2 + 2x - 3$

   A. $(x + 3)(x - 1)$

   B. $(x + 3)(x + 1)$

   C. $(x - 3)(x + 1)$

   D. $(x - 3)(x - 1)$

6. What is the complete factored form of $9x^2 + 16y^2$ ?

   A. $(3x + 4y)(3x - 4y)$

   B. $(3x + 4y)^2$

   C. $3\left(x^2 + 16y^2\right)$

   D. It is not factorable.

7. A rectangular plot of land has an area of $2x^2 + 5x - 3$ square yards. Which could be the dimensions of the plot of land?

   A. $(2x - 1)$ by $(x + 3)$

   B. $(2x - 3)$ by $(x + 1)$

   C. $(2x - 1)$ by $(x - 3)$

   D. $(2x + 3)$ by $(x - 1)$

8. What is the complete factoring of $24n^2 - 14n - 24$ ?

   A. $(6n - 8)(4n + 3)$

   B. $2(3n + 4)(4n - 3)$

   C. $2(3n - 4)(4n + 3)$

   D. $6(n + 2)(4n - 3)$

9. Carrie wants to find a number, $n$ , such that six less than ten times the number squared is eleven times the number. She sets up the following equation to find $n$ .

   $10n^2 - 6 = 11n$

   Which of the following represents the factorization needed to solve for $n$ ?

   A. $(5n - 2)(2n + 3) = 0$

   B. $(5n + 2)(2n - 3) = 0$

   C. $(5n - 2)(2n - 3) = 0$

   D. $(5n + 2)(2n + 3) = 0$

10. What are the zeros of the function $f(n) = n^2 + 13n + 42$ ?

    A. $n = 6, n = 7$

    B. $n = 3, n = 14$

    C. $n = -7, n = -6$

    D. $n = -14, n = -3$

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11. The function $y(x) = 2x^2 + 5x - 12$ is graphed on a coordinate plane. What are the *x*-intercepts of this function?

    A. $\left(\frac{3}{2}, 0\right)$ and $(-4, 0)$

    B. $\left(-\frac{1}{2}, 0\right)$ and $(3, 0)$

    C. $\left(\frac{1}{2}, 0\right)$ and $(-3, 0)$

    D. $\left(-\frac{3}{2}, 0\right)$ and $(4, 0)$

12. What is the sum of the *x*-intercepts of the function $y = 4x^2 - 9$ ?

    A. 3

    B. $\dfrac{3}{2}$

    C. 0

    D. $-3$

13. What is the solution set for the equation $x^2 + x - 12 = 0$ ?

    A. $\{-1, 12\}$

    B. $\{-3, 4\}$

    C. $\{-4, 3\}$

    D. $\{-12, 1\}$

14. The height, $h$ , in feet, of a soccer ball $t$ seconds after being kicked upward is given by the formula $h = 96t - 16t^2$ . How many seconds after the kick will the soccer ball hit the ground?

    A. 3 seconds

    B. 6 seconds

    C. 9 seconds

    D. 16 seconds

15. Mr. Jonelle solved the equation $s^2 - 2s - 3 = 0$ by completing the square.

    Step 1: $s^2 + 2s = 3$
    Step 2: $s^2 - 2s + 1 = 3 + 1$
    Step 3: $s^2 - 2s + 1 = 4$

    Which step is next in Mr. Jonelle's solution?

    A. $(s - 1)^2 = 4$

    B. $(s + 1)^2 = 4$

    C. $(s - 1)^2 = 2$

    D. $(s + 1)^2 = 2$

16. The students in Ms. Halperin's class want to solve this equation by using the quadratic formula.

    $32x^2 - 6x + 5 = 0$

    Which values do the students need to substitute for $a$ , $b$ , and $c$ in the quadratic formula to solve the equation?

    A. $a = 32x^2, b = -6x, c = 5$

    B. $a = 32, b = -6, c = 5$

    C. $c = 5, b = -6, c = 32$

    D. $a = -6, b = 5, c = 0$

17. Four students were asked to solve the following equation using the quadratic formula.

    $x^2 + 2x = 12x + 7$

    Which of these shows the formula set up correctly to find both solutions of the above equation?

    A. $\dfrac{-10 + \sqrt{100 - (4)(1)(-7)}}{(2)(1)}$

    B. $\dfrac{-12 + \sqrt{144 - (4)(2)(7)}}{(2)(2)}$

    C. $\dfrac{12 \pm \sqrt{144 - (4)(1)(7)}}{(2)(1)}$

    D. $\dfrac{10 \pm \sqrt{100 - (4)(1)(-7)}}{(2)(1)}$

18. What are the solutions, rounded to the nearest hundredth, of the equation $2 + 4x + x^2 = 0$ ?

    A. $0.29, 1.71$

    B. $0.59, 3.41$

    C. $-0.29, -1.71$

    D. $-0.59, -3.41$

19. Kelly graphed the equation $y = 8x^2 - 1$. Which BEST describes how the graph will change if she graphs $y = 5x^2 - 1$ instead?

    A. The shape of the parabola will be wider.

    B. The shape of the parabola will be narrower.

    C. The $y$-intercept of the parabola will be 5 instead of 8.

    D. The parabola will open downward instead of upward.

20. Mrs.Gonzales and her students are graphing two quadratic functions on the same coordinate plane. The first function they graph is $y = x^2$. The second function translates the minimum point of the first function to the coordinate $(3, 4)$. Which equation represents the second function?

    A. $y = (x + 3)^2 + 4$

    B. $y = (x + 3)^2 - 4$

    C. $y = (x - 3)^2 + 4$

    D. $y = (x - 3)^2 - 4$

21. In the parabola shown, what are the coordinates of the $y$-intercept?
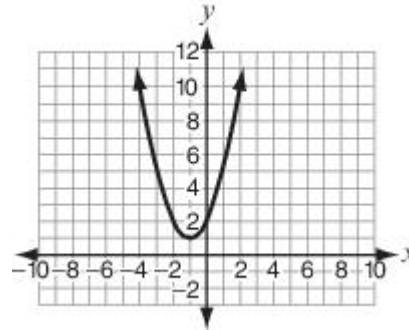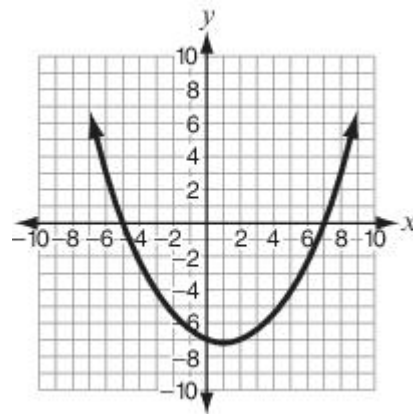


    A. $(-1, 1)$

    B. $(0, 2)$

    C. $(2, 0)$

    D. There is no $y$-intercept because the parabola does not intersect the $y$-axis.

22. Which graph BEST represents the polynomial equation, $y = -x^2 - 1$ ?
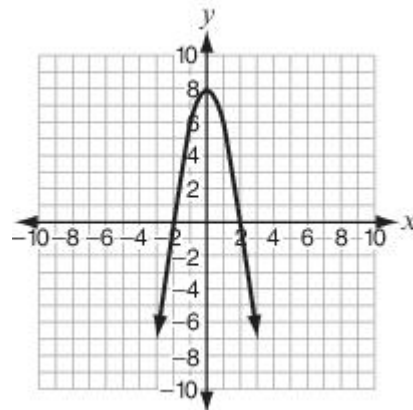
A.



B.



C.



D.
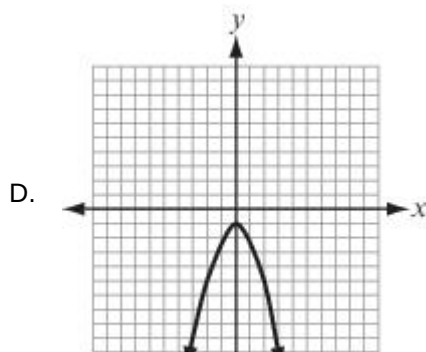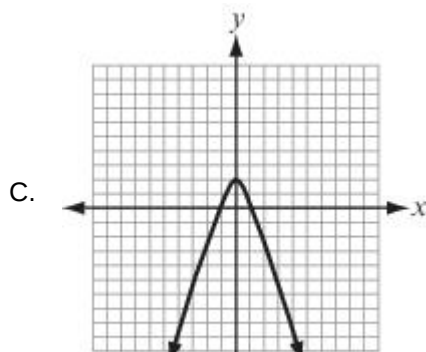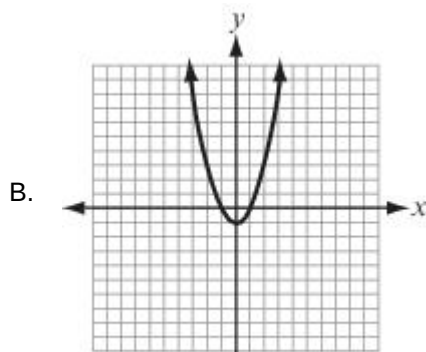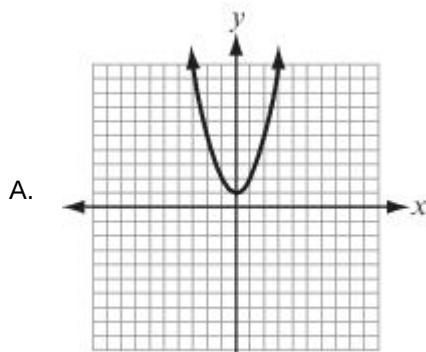


23. The function $y = 0.2x^2 - 0.4x - 7$ is graphed below.
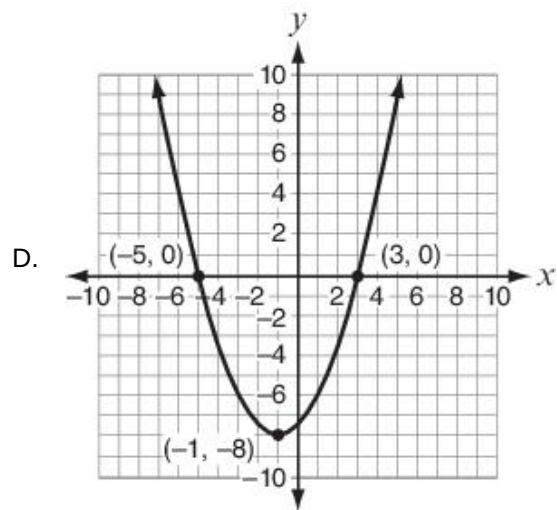


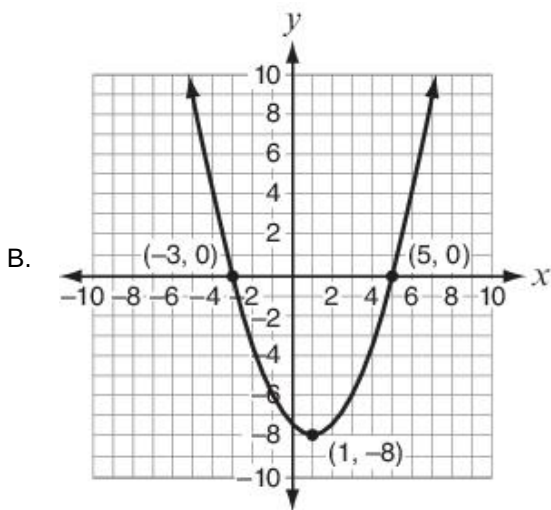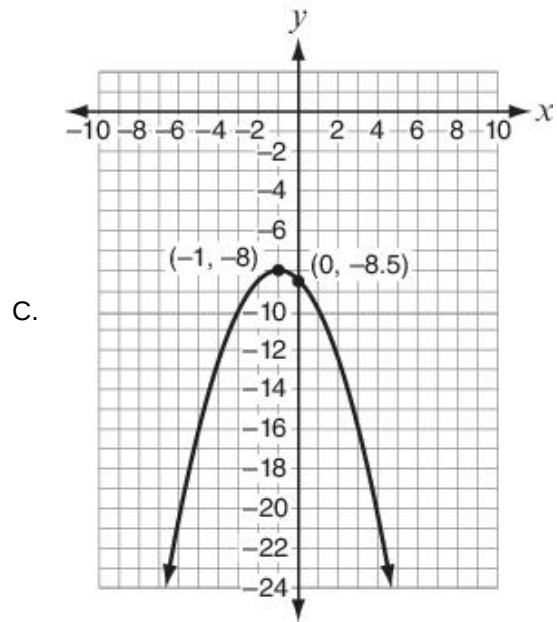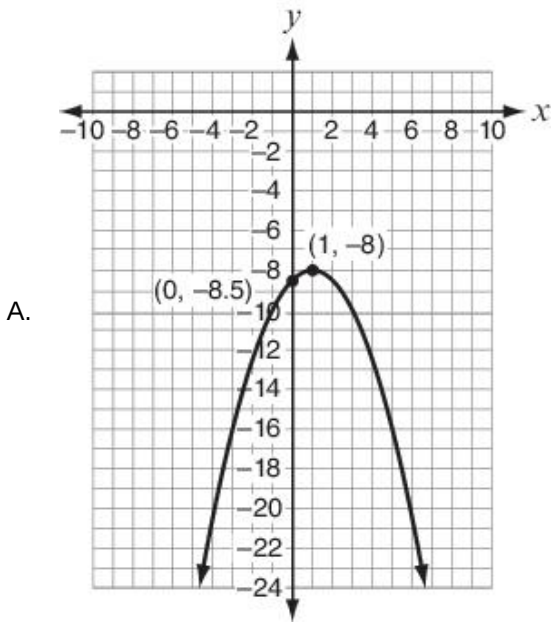What are the zeros of the function?

A. $5$

B. $-7$

C. $-5$ and $7$

D. $-7$ and $7$

24. What are the root(s) of the quadratic equation that is graphed below?



A. $x = 0$

B. $x = 0, y = 8$

C. $x = -2, x = 2$

D. $x = -2, x = 2, y = 8$

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25. How many times does the graph of $y = x^2 - 2x + 1$
    intersect the *x*-axis?

    A.   0

    B.   1

    C.   2

    D.   3

26. Which graph is the graph of $f(x) = \frac{1}{2}(x-1)^2 - 8$ ?

A.



C.



B.



D.

27.  Consider the equation $y = -3x^2 + 2x - 1$. What is determined by the coefficient of the $x^2$ term?

 A.  It identifies an *x*-intercept of the parabola.

 B.  It identifies the *y*-intercept of the parabola.

 C.  It identifies the direction the parabola opens.

 D.  It identifies a coordinate of the vertex of the parabola.

28.  The equation $y = x^2$ is graphed on the coordinate plane.
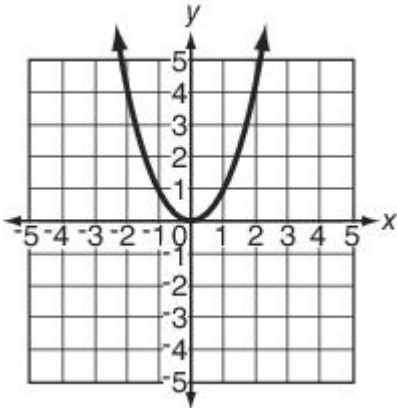


Which graph represents $y = 2(x - 3)^2 + 2$ ?

A.


C.


B.


D.
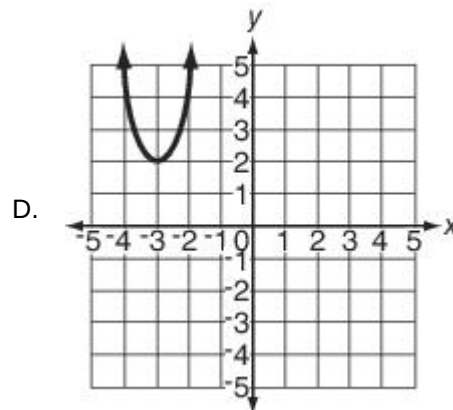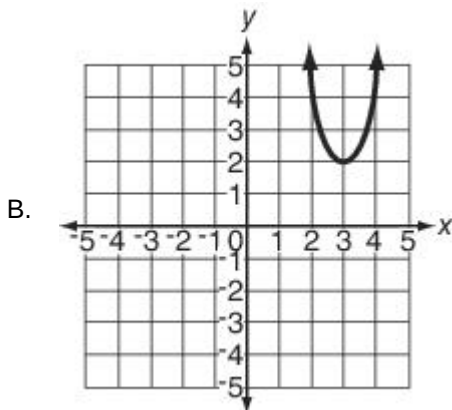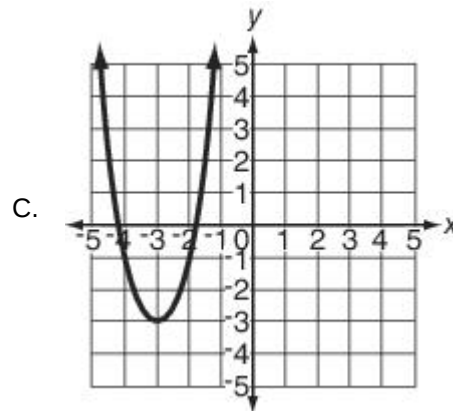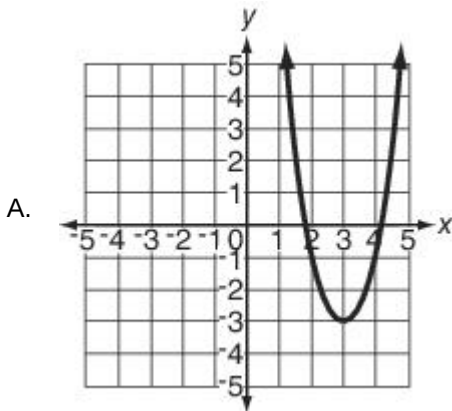

**Stop! You have finished this exam.**