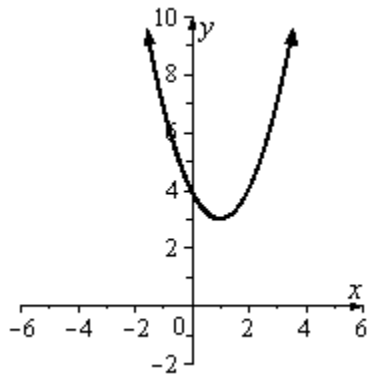


1. Using the table, determine $f(-5)$.

x	$f(x) = x^2 + 3x + 2$
-4	6
-3	2
-2	0
-1	0
0	2
1	6
2	12
3	20
4	30

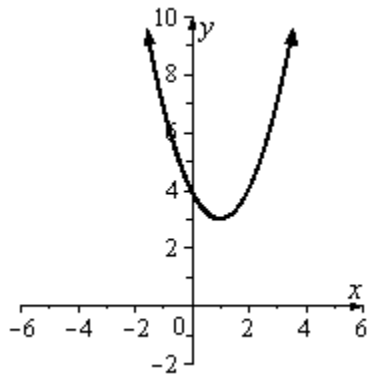
- A) 42
B) 6
C) 20
D) 1
E) 12
2. Find the x -intercepts of the parabola: $y = 4x^2 - 36$
- A) $(3,0), (-2,0)$
B) $(3,0)$
C) $(0,-3), (0,3)$
D) $(-3,0), (3,0)$
E) $(0,-3), (-3,0)$

3. Using the graph, find the y-intercept point.



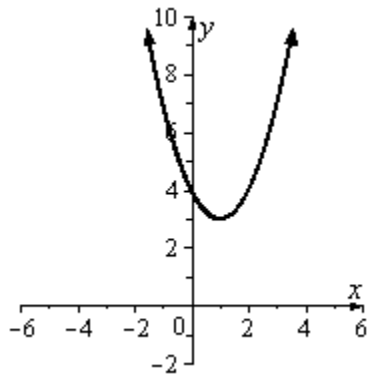
- A) (4, 0)
- B) (0, 4)
- C) (3, 1)
- D) (1, 3)
- E) no y-intercept

4. Using the graph, find the equation for the axis of symmetry.



- A) $y = 3$
- B) $y = 4$
- C) $x = 1$
- D) $x = 4$
- E) $x = 0$

5. Using the graph, find the vertex.



- A) (1, 4)
- B) (4, 0)
- C) (0, 4)
- D) (3, 1)
- E) (1, 3)

6. Find the minimum or maximum of the quadratic function:

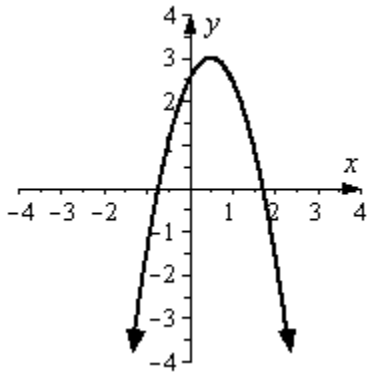
$$y = x^2 - 10x + 10$$

- A) Minimum: -15
- B) Minimum: 35
- C) Minimum: 5
- D) Minimum: 15
- E) Maximum: -17

7. Find the x -intercepts of the parabola: $y = 4x^2 - 64$

- A) (4,0), (-3,0)
- B) (4,0)
- C) (0,-4), (0,4)
- D) (-4,0), (4,0)
- E) (0,-4), (-4,0)

8. Using the graph, find the equation for the axis of symmetry.

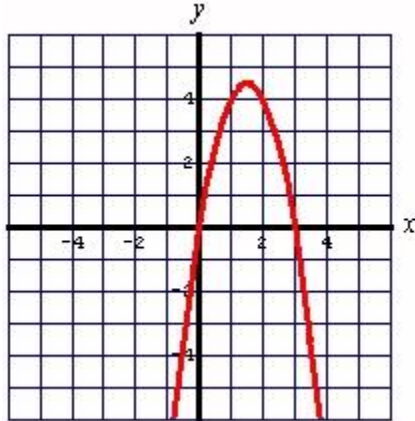


- A) $x = \frac{1}{2}$
- B) $x = 1$
- C) $y = 3$
- D) $y = 1$
- E) $y = \frac{1}{2}$

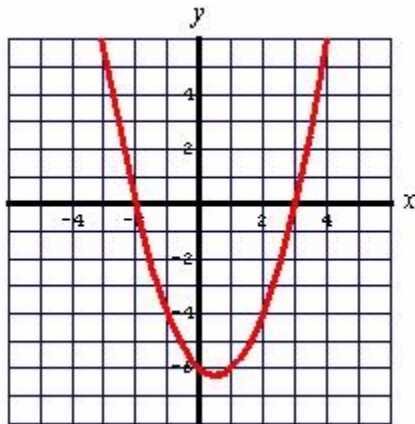
9. Find the vertex and axis of symmetry, and then graph the parabola given by:

$$y = -2x^2 + 6x$$

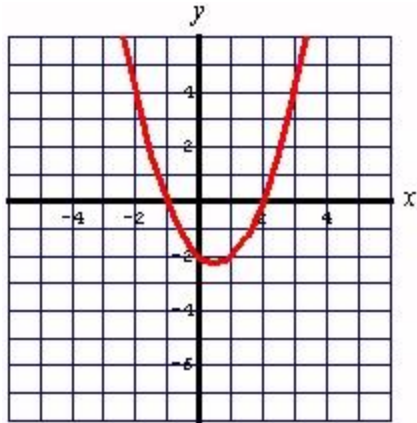
A) Vertex: $(\frac{3}{2}, \frac{9}{2})$; Axis of symmetry: $x = \frac{3}{2}$



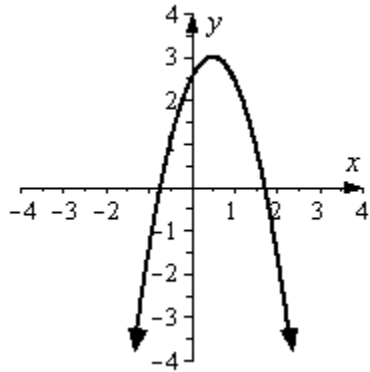
B) Vertex: $(\frac{1}{2}, \frac{-25}{4})$; Axis of symmetry: $x = \frac{1}{2}$



C) Vertex: $(\frac{3}{2}, \frac{-9}{4})$; Axis of symmetry: $x = \frac{1}{2}$



10. Using the graph, find the vertex.



- A) $\left(3, \frac{1}{2}\right)$
- B) $\left(\frac{1}{2}, 3\right)$
- C) $\left(0, 2\frac{1}{2}\right)$
- D) $\left(2\frac{1}{2}, 0\right)$
- E) $(1, 3)$

11. Find the minimum or maximum of the quadratic function:

$$y = 4x^2 + 8x$$

- A) Minimum: -4
- B) Minimum: -1
- C) Minimum: 12
- D) Minimum: 4
- E) Minimum: -3

12. Find the x -intercepts of the parabola: $y = x^2 - 2x - 15$

- A) $(3,0), (5,0)$
- B) $(3, 5)$
- C) $(0,-3), (5, 0)$
- D) $(-3,0), (5, 0)$
- E) $(0,-3), (0,5)$

13. Using a table and graph, find the equation for the axis of symmetry.

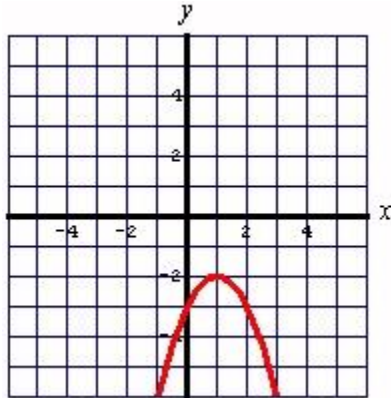
$$f(x) = -x^2 - 6x - 4$$

- A) $y = -3$
- B) $y = 5$
- C) $y = -4$
- D) $x = -3$
- E) $x = 5$

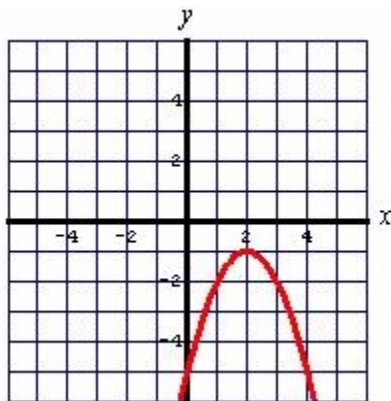
14. Find the vertex and axis of symmetry, and then graph the parabola given by:

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

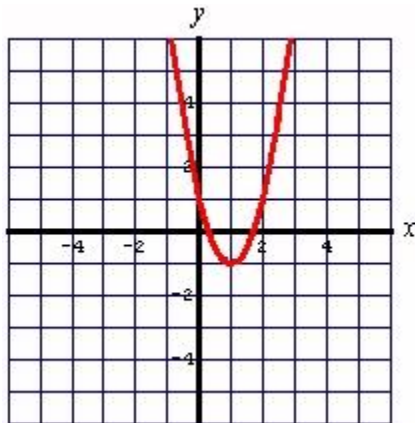
A) Vertex: $(1, -2)$; Axis of symmetry: $x = 1$



B) Vertex: $(2, -1)$; Axis of symmetry: $x = 2$



C) Vertex: $(1, -1)$; Axis of symmetry: $x = 1$



15. Find the vertex of the following equation.

$$f(x) = -x^2 + 4x - 10$$

- A) (0, -10)
- B) (-10, 0)
- C) (2, -6)
- D) (-6, 2)
- E) (-6, -10)

16. Find the minimum or maximum of the quadratic function:

$$y = -9x^2 + 6x - 8$$

- A) Maximum: -7
- B) Maximum: 2
- C) Maximum: 9
- D) Maximum: -9
- E) Minimum: 3

17. Find the x -intercepts of the parabola: $y = 8x^2 + 13x - 6$

- A) $(2, 0), \left(\frac{3}{8}, 0\right)$
- B) $\left(2, \frac{3}{8}\right)$
- C) $(0, -2), \left(\frac{3}{8}, 0\right)$
- D) $(-2, 0), \left(\frac{3}{8}, 0\right)$
- E) $(0, -2), \left(0, \frac{3}{8}\right)$

18. The vertex of a parabola is $(-7, -1)$ and opens upward. What is the equation of the axis of symmetry of the parabola?

- A) $y = -1$
- B) $x = 7$
- C) $x = -7$
- D) $y = 1$
- E) $x = -1$

19. Find the minimum or maximum of the quadratic function:

$$y = -5x^2 + 10x - 1$$

- A) Maximum: 4
- B) Maximum: 1
- C) Maximum: 6
- D) Maximum: -4
- E) Minimum: -5

20. **Physics:** The height, s , in feet, of a rock thrown upward at an initial speed of 76 ft/s from a cliff 40 ft above the ocean beach is given by the function $s(t) = -16t^2 + 76t + 40$, where t is the time in seconds.

Find the maximum height above the beach that the rock will attain.

- A) 130.25 ft
- B) 2.4 ft
- C) 130 ft
- D) 139.25 ft
- E) 122.25 ft

21. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

1, 8, 11, 37, 640, . . .

- A) linear; $y = 2x + 1$
- B) quadratic; $y = 2x^2$
- C) quadratic; $y = 2x^2 + 1$
- D) linear; $y = 2x$
- E) neither

22. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

8, 24, 48, 80, 120, . . .

- A) linear; $y = 4x$
- B) quadratic; $y = 4x^2 + x$
- C) quadratic; $y = 4x^2 + 4x$
- D) linear; $y = 16x^2$
- E) neither

23. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

8, 15, 22, 29, 36, . . .

- A) linear; $y = 7x$
- B) quadratic; $y = 7x^2 + 1$
- C) linear; $y = 7x + 1$
- D) quadratic; $y = 7x^2 - 1$
- E) neither

24. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

5, 12, 21, 32, 45, . . .

- A) linear; $y = 4x$
- B) quadratic; $y = x^2 + 4x$
- C) linear; $y = x$
- D) quadratic; $y = x^2 + x$
- E) neither

25. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

35, 42, 47, 50, 51, . . .

- A) quadratic; $y = -x^2 + 10x + 26$
- B) linear; $y = 10x + 26$
- C) linear; $y = -10x + 26$
- D) quadratic; $y = x^2 + 10x + 26$
- E) neither

26. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

2, 2, 3, 4, 6, 9, . . .

- A) quadratic; $y = 2x$
- B) linear; $y = 2x$
- C) linear; $y = 4x$
- D) quadratic; $y = 3x$
- E) neither

27. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

21, 25, 29, 33, 37, . . .

- A) quadratic; $y = 4x^2 + 17$
- B) linear; $y = 4x + 2$
- C) linear; $y = 4x + 17$
- D) quadratic; $y = 4x^2 + 2$
- E) neither

28. Use first and second differences to find out whether each sequence may be described with a linear function, a quadratic function, or neither. Use the table method to fit a linear or quadratic equation.

6,13,27,34,37, . . .

- A) linear; $y = 6x$
- B) quadratic; $y = 7x$
- C) linear; $y = 8x$
- D) quadratic; $y = 6x$
- E) neither

29. Add the following. Use a vertical format.

$$(3x^2 + 3x + 2) + (4x^2 + 5x - 8)$$

- A) $7x^2 + 2x - 6$
- B) $7x^2 + 8x + 6$
- C) $7x + 8x^2 - 6$
- D) $7x^2 + 8x - 6$
- E) $7x^2 + 8x - 2$

30. Add the following. Use a vertical format.

$$(5r^3 - 10r^2 + 11r) + (-14 - 5r + 3r^2)$$

- A) $5r^3 + 7r^2 + 6r - 14$
- B) $5r^3 - 7r^2 + 6r + 14$
- C) $5r^3 - 7r^2 + 6r - 14$
- D) $5r^3 + 7r^2 - 6r - 14$
- E) $5r^3 - 7r^2 + 6r - 3$

31. Add the following. Use a horizontal format.

$$(-10x^2 + 3x + 4) + (3x^2 + 4x - 11)$$

- A) $-7x^2 - x - 7$
- B) $-7x^2 + 7x + 7$
- C) $-7x + 7x^2 - 7$
- D) $-7x^2 + 7x - 7$
- E) $-7x^2 - x + 15$

32. Add the following. Use a horizontal format.

$$(5y^3 - 5y^2 + 7y) + (-11 - 2y + 2y^2)$$

- A) $7y^3 + 3y^2 + 5y - 11$
- B) $5y^3 - 3y^2 + 5y + 11$
- C) $5y^3 - 3y^2 + 5y - 11$
- D) $5y^3 - 3y^2 - 5y - 11$
- E) $7y^3 - 7y^2 + 5y - 4$

33. Subtract the following. Use a vertical format.

$$(3x^2 + 11x + 4) - (5x^2 - 6x + 7)$$

- A) $-2x^2 + 11x - 3$
- B) $-2x^2 + 17x + 3$
- C) $-2x + 17x^2 + 3$
- D) $-2x^2 + 5x - 3$
- E) $-2x^2 + 17x - 3$

34. Subtract the following. Use a vertical format.

$$(5y^2 - 8y + 5) - (-10 + 2y - 2y^3)$$

- A) $2y^3 + 5y^2 + 10y - 15$
- B) $-2y^3 - 5y^2 + 10y + 15$
- C) $2y^3 + 5y^2 - 10y + 15$
- D) $2y^3 - 5y^2 - 10y - 15$
- E) $-2y^3 + 3y^2 + 6y - 5$

35. Subtract the following. Use a vertical format.

$$(10x^2 + 10x - 4) - (4x + 14x^2 - 10)$$

- A) $-4x^2 + 6x + 6$
- B) $-4x^2 + 24x - 6$
- C) $-4x + 6x^2 - 6$
- D) $-4x^2 - 6x + 6$
- E) $-4x^2 + 6x - 6$

36. Subtract the following. Use a horizontal format.

$$(2x^3 + 7x + 8) - (-12x^2 + 2x - 2)$$

- A) $2x^3 - 12x^2 - 5x + 10$
- B) $2x^3 - 12x^2 + 5x + 10$
- C) $2x^3 + 12x^2 + 5x + 10$
- D) $2x^3 - 12x^2 - 5x - 10$
- E) $14x^3 + 5x - 6$

37. Given $P(x) = x^2 - 3xy + y^2$ and $R(x) = 6x^2 - 6y^2$, find $P(x) + R(x)$.

- A) $6x^2 - 3xy - 3y^2$
- B) $7x^2 - 3xy - 3y^2$
- C) $7x^2 - 2xy - 3y^2$
- D) $6x^2 - 2xy - 2y^2$
- E) $7x^2 - 3xy - 5y^2$

38. Given $P(x) = 7x^2 + 6y^2$ and $R(x) = -13x^2 + 6xy - 7y^2$, find $P(x) - R(x)$.

- A) $-6x^2 - 6xy + 13y^2$
- B) $20x^2 - 6xy + 12y^2$
- C) $-6x^2 - 6xy + 12y^2$
- D) $20x^2 - 6xy + 13y^2$
- E) $-6x^2 - 7xy + 12y^2$

39. Multiply:

$$(x^2 - 7x + 4)(x - 2)$$

- A) $x^3 - 9x^2 + 18x - 8$
- B) $x^3 - 9x^2 + 18x + 8$
- C) $x^3 - 9x^2 - 18x - 8$
- D) $x^3 + 9x^2 + 18x - 8$
- E) $x^3 + 9x^2 - 18x - 8$

40. Multiply:

$$(x^2 - 4x + 5)(5x - 3)$$

- A) $5x^3 - 23x^2 + 37x - 15$
- B) $5x^3 - 23x^2 + 37x + 15$
- C) $5x^3 - 23x^2 - 37x - 15$
- D) $5x^3 + 23x^2 + 37x - 15$
- E) $5x^3 + 23x^2 - 37x - 15$

41. Multiply:

$$(-7x^2 + 7x - 2)(2x - 3)$$

- A) $-14x^3 - 35x^2 - 25x + 6$
- B) $-14x^3 + 35x^2 - 25x - 6$
- C) $-14x^3 + 35x^2 - 25x + 6$
- D) $-14x^3 - 35x^2 + 25x + 6$
- E) $-14x^3 + 35x^2 + 25x - 6$

42. Multiply:

$$(7y^3 + 4y^2 + 5)(5y - 1)$$

- A) $35y^4 - 13y^3 + 4y^2 + 25y - 5$
- B) $35y^4 + 13y^3 - 4y^2 + 25y - 5$
- C) $35y^4 + 13y^3 + 4y^2 + 25y - 5$
- D) $35y^4 - 13y^3 - 4y^2 + 25y - 5$
- E) $35y^4 + 13y^3 + 4y^2 - 25y - 5$

43. Multiply:

$$(y^3 + 2y^2 - 2y + 1)(y + 4)$$

- A) $y^4 + 6y^3 + 6y^2 + 7y + 4$
- B) $y^4 - 6y^3 + 6y^2 - 7y + 4$
- C) $y^4 - 6y^3 + 6y^2 + 7y + 4$
- D) $y^4 + 6y^3 + 6y^2 - 7y + 4$
- E) $y^4 + 6y^3 - 6y^2 - 7y - 4$

44. Multiply:

$$(x+7)(x+2)$$

- A) $x^2 + 9x + 14$
- B) $x^2 + 9x - 14$
- C) $x^2 + 14$
- D) $x^2 - 9x + 14$
- E) $x^2 + 5x + 14$

45. Multiply:

$$(x-2)(x+5)$$

- A) $x^2 - 3x - 10$
- B) $x^2 + 3x + 10$
- C) $x^2 - 10$
- D) $x^2 + 3x - 10$
- E) $x^2 - 2x - 10$

46. Multiply:

$$(x-4)(x-3)$$

- A) $x^2 - 7x + 12$
- B) $x^2 + 12x + 12$
- C) $x^2 + 12$
- D) $x^2 - 7x - 12$
- E) $x^2 - 4x - 12$

47. Multiply:

$$(y+7)(3y+1)$$

- A) $3y^2 + 21y + 7$
- B) $3y^2 + 7$
- C) $3y^2 + 22y - 7$
- D) $3y^2 + 22y + 7$
- E) $3y^2 - 22y + 7$

48. Multiply:

$$(5a - 2)(a + 3)$$

- A) $5a^2 - 13a + 6$
- B) $5a^2 + 13a + 6$
- C) $5a^2 - 2a - 6$
- D) $5a^2 - 13a - 6$
- E) $5a^2 + 13a - 6$

49. Multiply:

$$(4y - 2)(y - 3)$$

- A) $4y^2 + 14y + 6$
- B) $4y^2 - 14y + 6$
- C) $4y^2 - 2y - 6$
- D) $4y^2 + 14y - 6$
- E) $4y^2 - 14y - 6$

50. Multiply:

$$(7y - 3)(3y - 3)$$

- A) $21y^2 - 9y + 9$
- B) $21y^2 - 30y + 9$
- C) $21y^2 + 30y + 9$
- D) $21y^2 - 30y - 9$
- E) $21y^2 - 9y - 9$

51. Multiply:

$$(2a + 2b)(a - 6b)$$

- A) $2a^2 + 10ab - 12b^2$
- B) $2a^2 - 10ab + 12b^2$
- C) $2a^2 + 2ab - 12b^2$
- D) $2a^2 - 10ab - 12b^2$
- E) $2a^2 - 12ab - 12b^2$

52. Multiply:

$$3(3x - 2y)(3x + 5y)$$

- A) $27x^2 + 27xy - 30y^2$
- B) $9x^2 + 9xy + 10y^2$
- C) $27x^2 - 27xy + 30y^2$
- D) $27x^2 - 27xy - 30y^2$
- E) $9x^2 - 9xy + 10y^2$

53. Multiply:

$$(xy + 9)(xy - 4)$$

- A) $x^2y^2 + 5xy - 36$
- B) $x^2y^2 + 9xy + 36$
- C) $x^2y^2 - 4xy + 36$
- D) $x^2y^2 - 5xy - 36$
- E) $x^2y^2 - 36$

54. Multiply:

$$(4x^2 - 4y)(2x^2 - y)$$

- A) $8x^4 - 8x^2y + 4y^2$
- B) $8x^4 - 12x^2y + 4y^2$
- C) $8x^4 - 4x^2y + 4y^2$
- D) $8x^4 + 12x^2y - 4y^2$
- E) $8x^4 + 4y^2$

55. Multiply:

$$(x^2 + 5x - 2)(x^2 - 7x + 9)$$

- A) $x^4 - 2x^3 - 28x^2 - 59x - 18$
- B) $x^4 - 2x^3 - 28x^2 + 59x + 18$
- C) $x^4 - 2x^3 - 28x^2 - 59x + 18$
- D) $x^4 - 2x^3 - 28x^2 + 59x - 18$
- E) $x^4 + 2x^3 - 28x^2 + 59x - 18$

56. Multiply:

$$(a-4)(4a-2)(a+8)$$

- A) $4a^3 + 14a^2 - 136a - 64$
- B) $4a^3 + 14a^2 - 136a + 64$
- C) $4a^3 + 14a^2 + 136a - 64$
- D) $4a^3 + 14a^2 + 136a + 64$
- E) $4a^3 - 14a^2 - 136a - 64$

57. Identify answers that are perfect square trinomials or differences of squares.

$$(6x+3)(4x+3)$$

- A) $6x^2 + 18x + 9$
- B) $24x^2 + 30x + 9$
- C) $24x^2 - 30x + 9$
- D) $24x^2 + 30x - 9$
- E) $24x^2 + 9x - 30$

58. Identify answers that are perfect square trinomials or differences of squares.

$$(a-7b)(2a+5b)$$

- A) $2a^2 + 9ab - 35b^2$
- B) $2a^2 - 9ab + 35b^2$
- C) $2a^2 - 14ab - 35ab^2$
- D) $2a^2 - 9ab - 35b^2$
- E) $2a^2 + 5ab - 35b^2$

59. Identify answers that are perfect square trinomials or differences of squares.

$$(2a+4b)(a-3b)$$

- A) $2a^2 + 2ab - 12b^2$
- B) $2a^2 - 2ab + 12b^2$
- C) $2a^2 + 4ab - 12b^2$
- D) $2a^2 - 2ab - 12b^2$
- E) $2a^2 - 6ab - 12b^2$

60. Factor:

$$a^2 + 4a + 4$$

- A) $(a+2)(a-2)$
- B) $(a-2)^2$
- C) $(a+2)^2$
- D) $(2+a)(2-a)$
- E) Nonfactorable

61. Factor:

$$a^2 - 10a + 25$$

- A) $(a+5)(a-5)$
- B) $(a-5)^2$
- C) $(a+5)^2$
- D) $(5+a)(5-a)$
- E) Nonfactorable

62. Factor:

$$x^2 - 6x - 9$$

- A) $(x+3)(x-3)$
- B) $(x-3)^2$
- C) $(x+3)^2$
- D) $(3+x)(3-x)$
- E) Nonfactorable

63. Factor:

$$x^2 + 8xy + 16y^2$$

- A) $(x+4y)(x-4y)$
- B) $(x-4y)^2$
- C) $(x+4y)^2$
- D) $(4y+x)(4y-x)$
- E) Nonfactorable

64. Factor:

$$a^2 - 25$$

- A) $(a+5)(a-5)$
- B) $(a-5)^2$
- C) $(a+5)^2$
- D) $(5+a)(5-a)$
- E) Nonfactorable

65. Factor:

$$25c^2 - 9$$

- A) $(3+5c)(3-5c)$
- B) $(5c-3)^2$
- C) $(5c+3)^2$
- D) $(5c+3)(5c-3)$
- E) Nonfactorable

66. Factor:

$$b^{12} - 4$$

- A) $(b^6+2)(b^6-2)$
- B) $(b^6-2)^2$
- C) $(b^6+2)^2$
- D) $(2+b^6)(2-b^6)$
- E) Nonfactorable

67. Factor:

$$25x^2 - 9y^2$$

- A) $(3y+5x)(3y-5x)$
- B) $(5x-3y)^2$
- C) $(5x+3y)^2$
- D) $(5x+3y)(5x-3y)$
- E) Nonfactorable

68. Factor:

$$36b^2c^2 - 49$$

- A) $(7 + 6bc)(7 - 6bc)$
- B) $(6bc - 7)^2$
- C) $(6bc + 7)^2$
- D) $(6bc + 7)(6bc - 7)$
- E) Nonfactorable

69. Multiply:

$$(9x^2 - 3)(x^2 - 3)$$

- A) $9x^4 - 27x^2 - 9$
- B) $9x^4 - 30x^2 + 9$
- C) $9x^4 - 3x^2 - 9$
- D) $9x^4 + 30x^2 + 9$
- E) $9x^4 + 9$

70. Multiply:

$$(8x^2 - 8y)(2x^2 - y)$$

- A) $16x^4 - 16x^2y + 8y^2$
- B) $16x^4 - 24x^2y + 8y^2$
- C) $16x^4 - 8x^2y + 8y^2$
- D) $16x^4 + 24x^2y - 8y^2$
- E) $16x^4 + 8y^2$

71. Factor the following expression:

$$x^3 - 512$$

- A) $(x + 8)(x^2 - 8x + 64)$
- B) $(x - 8)(x^2 + 8x + 64)$
- C) $(x + 8)(x^2 + 8x - 64)$
- D) $(x - 8)(x^2 - 8x + 64)$
- E) Nonfactorable

72. Factor the following expression:

$$y^3 + 729$$

- A) $(y-9)(y^2 + 9y + 81)$
- B) $(y+9)(y^2 - 9y + 81)$
- C) $(y+9)(y^2 + 9y - 81)$
- D) $(y-9)(y^2 + 9y - 81)$
- E) Nonfactorable

73. Factor the following expression:

$$64a^3 + 125$$

- A) $(4a+5)(16a^2 - 20a + 25)$
- B) $(4a-5)(16a^2 - 20a + 25)$
- C) $(4a+5)(16a^2 + 20a + 25)$
- D) $(4a-5)(16a^2 + 20a + 25)$
- E) Nonfactorable

74. Factor the following expression:

$$27x^3 - 64y^3$$

- A) $(3x-4y)(9x^2 + 16y^2)$
- B) $(3x-4y)(9x^2 + 12xy + 16y^2)$
- C) $(3x-4y)(9x^2 - 12xy + 16y^2)$
- D) $(3x+4y)(9x^2 - 12xy + 16y^2)$
- E) Nonfactorable

75. Solve:

$$(x+4)(x-2) = 0$$

- A) 4, 2
- B) 4, -2
- C) -4, 2
- D) -4, -2
- E) No solution

76. Solve:

$$x^2 + 11x + 18 = 0$$

- A) 2, 9
- B) 2, -9
- C) -2, 9
- D) -2, -9
- E) No solution

77. Solve:

$$x^2 - 13x = -36$$

- A) 4, 9
- B) 4, -9
- C) -4, 9
- D) -4, -9
- E) No solution

78. Solve:

$$y^2 - 25 = 0$$

- A) 5, -5
- B) 0, 25
- C) 0, 5
- D) 5
- E) No solution

79. Solve:

$$49a^2 - 9 = 0$$

- A) $0, \frac{3}{7}$
- B) $0, \frac{9}{49}$
- C) $\frac{3}{7}, -\frac{3}{7}$
- D) $\frac{3}{7}$
- E) No solution

80. Solve:

$$z^2 + 3z = 0$$

- A) -3
- B) $0,3$
- C) $0,-3$
- D) $-3,3$
- E) No solution

81. Solve:

$$6a^2 - 24a = 0$$

- A) 4
- B) $0,4$
- C) $0,-4$
- D) $4,-4$
- E) No solution

82. Solve:

$$b(b+2) = 0$$

- A) -2
- B) $0,2$
- C) $0,-2$
- D) $-2,2$
- E) No solution

83. Solve:

$$z(5z+2) = 0$$

- A) $-\frac{2}{5}$
- B) $0,\frac{2}{5}$
- C) $0,-\frac{2}{5}$
- D) $-5,2$
- E) No solution

84. Solve:

$$c^2 - 12c + 20 = 0$$

- A) 2, 10
- B) 2, -10
- C) -2, 10
- D) -2, -10
- E) No solution

85. Solve:

$$5x^2 - 23x - 10 = 0$$

- A) -2, 5
- B) $\frac{2}{5}, 5$
- C) $-\frac{2}{5}, 5$
- D) $-\frac{2}{5}, -5$
- E) No solution

86. Solve:

$$11y^2 - 50y = 25$$

- A) -5, 5
- B) $\frac{5}{11}, 5$
- C) $-\frac{5}{11}, 5$
- D) $-\frac{5}{11}, -5$
- E) No solution

87. Identify the function whose graph will make a steeper parabola.

$$f(x) = 3.78x^2 \text{ or } g(x) = \pi x^2$$

- A) $f(x)$
- B) $g(x)$
- C) They are equal.

88. Identify the function whose graph will make a steeper parabola.

$$g(x) = \pi x^2 \text{ or } h(x) = 4x^2$$

- A) $g(x)$
- B) $h(x)$
- C) none

89. Identify the function whose graph will make a steeper parabola.

$$k(x) = 4.3x^2 \text{ or } g(x) = \pi x^2$$

- A) $g(x)$
- B) $k(x)$
- C) none

90. Identify the function whose graph will make a steeper parabola.

$$g(x) = 2.514x^2 \text{ or } h(x) = 2.62x^2$$

- A) $g(x)$
- B) $h(x)$
- C) none

91. Identify the function whose graph will make a steeper parabola.

$$f(x) = \frac{2}{5}x^2 \text{ or } g(x) = \frac{4}{7}x^2$$

- A) $f(x)$
- B) $g(x)$
- C) They are equal.

92. Describe the shift of $y = (2x)^2$ by $y = (2x+4)^2$.

- A) shift 4 units to the left
- B) shift 2 units to the left
- C) shift 4 units to the right
- D) shift 2 units to the right
- E) shift 4 units up

93. Describe the shift of $y = x^2$ in terms of the value of r in $y = (x-r)^2$ if r is positive.
- A) shift r units to the left
 - B) shift r units up
 - C) shift r units to the right and r units up
 - D) shift r units to the right
 - E) shift r units down
94. A graph has the same shape as $y = x^2$. Its vertex is $(0, -6)$. What is its equation?
(There are two possibilities.)
- A) $y = x^2 - 7$ or $y = -x^2 + 6$
 - B) $y = x^2 + 7$ or $y = -x^2 - 6$
 - C) $y = x^2 - 6$ or $y = -x^2 - 6$
 - D) $y = x^2 - 6$ or $y = -x^2 + 8$
 - E) $y = x^2 - 7$ or $y = x^2 + 6$

Answer Key

1. E
2. D
3. B
4. C
5. E
6. A
7. D
8. A
9. A
10. B
11. A
12. D
13. D
14. A
15. C
16. A
17. D
18. C
19. A
20. A
21. E
22. C
23. C
24. B
25. A
26. E
27. C
28. E
29. D
30. C
31. D
32. C
33. E
34. C
35. A
36. C
37. E
38. D
39. A
40. A
41. C
42. B
43. D
44. A

- 45. D
- 46. A
- 47. D
- 48. E
- 49. B
- 50. B
- 51. D
- 52. A
- 53. A
- 54. B
- 55. D
- 56. B
- 57. B
- 58. D
- 59. D
- 60. C
- 61. B
- 62. E
- 63. C
- 64. A
- 65. D
- 66. A
- 67. D
- 68. D
- 69. B
- 70. B
- 71. B
- 72. B
- 73. A
- 74. B
- 75. C
- 76. D
- 77. A
- 78. A
- 79. C
- 80. C
- 81. B
- 82. C
- 83. C
- 84. A
- 85. C
- 86. C
- 87. A
- 88. B
- 89. B
- 90. B

- 91. B
- 92. B
- 93. D
- 94. C