



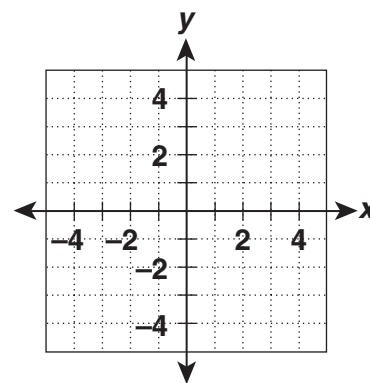
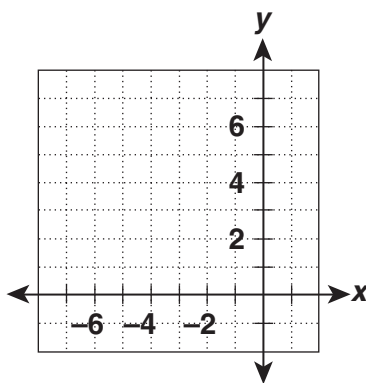
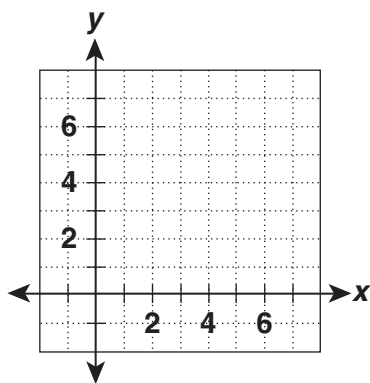
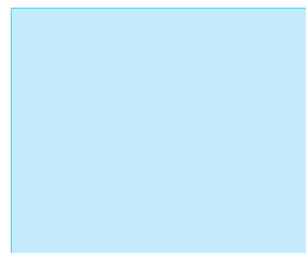
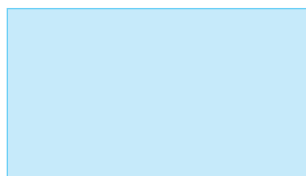
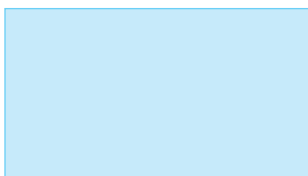
5-1 Using Transformations to Graph Quadratic Functions

Using the graph of $f(x) = x^2$ as a guide, describe the transformations, and then graph each function.

1. $g(x) = (x - 3)^2 + 2$

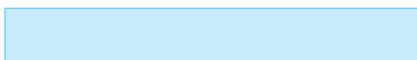
2. $g(x) = 3(x + 5)^2$

3. $g(x) = -\frac{1}{2}x^2 + 4$

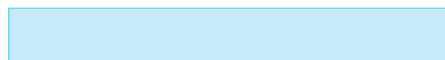


Use the description to write each quadratic function in vertex form.

4. $f(x)^2$ is vertically stretched by a factor of 5 and translated 4 units right to create $g(x)$.



5. $f(x)^2$ is reflected across the x -axis, shifted 3 units right, and translated 2 units down to create $g(x)$.

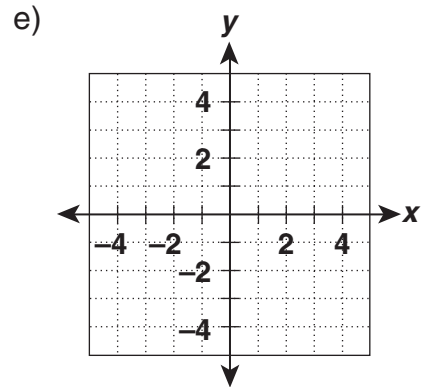
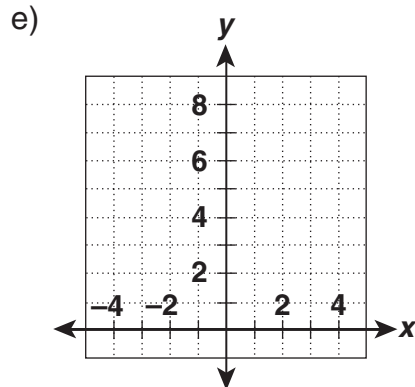
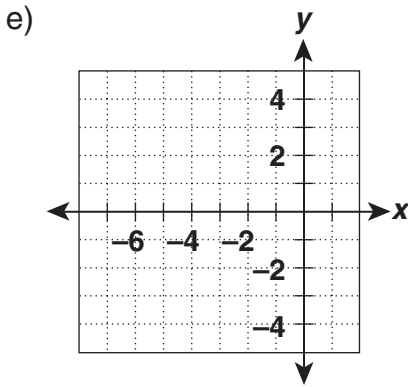


5-2 Properties of Quadratic Functions in Standard Form

For each function, (a) determine whether the graph opens upward or downward, (b) find the axis of symmetry, (c) find the vertex, (d) find the y-intercept, and (e) graph the function.

6. $f(x) = x^2 + 8x + 12$ 7. $g(x) = -x^2 - 2x + 8$ 8. $h(x) = -x^2 + 3x$

a)	a)	a)
b)	b)	b)
c)	c)	c)
d)	d)	d)



9. A baseball player hits a baseball whose height is modeled by the function $h(x) = -0.03x^2 + 2.4x + 2$ where x is the horizontal distance in feet that the ball travels. Find the maximum height of the ball to the nearest foot.

5-3 Solving Quadratic Equations by Graphing and Factoring

Find the roots of each equation by factoring.

10. $x^2 + x = 20$

11. $x^2 - 36 = 0$

12. $7x^2 - 49x = 0$

5-4 Completing the Square

Solve each equation by completing the square.

13. $x^2 + 2x = 63$

14. $x^2 - 10x = -14$

15. $x^2 = -12x + 9$

Write each function in vertex form, and identify its vertex.

16. $f(x) = x^2 + 8x + 14$

17. $g(x) = x^2 - 12x + 10$

18. $h(x) = -4x^2 + 24x - 39$

5-5 Complex Numbers and Roots

Solve each equation.

19. $6x^2 + 150 = 0$

20. $x^2 + 8x = -18$

21. $x^2 = x - 19$

5-6 The Quadratic Formula

Find the zeros of each function by using the Quadratic Formula.

22. $f(x) = 2x^2 + 8x + 24$

23. $g(x) = 3x^2 + 6x + 8$

24. $h(x) = -x^2 + 4x + 77$

Find the type and number of solutions for each equation.

25. $x^2 + 81 = 18x$

26. $x^2 + 9x = 36$

27. $x^2 - 100 = 0$

5-9 Operations with Complex NumbersPerform each indicated operation, and write the result in the form $a + bi$.

45. $(4 + 2i) - (5 - 3i)$



46. $(-7 - 2i) + (6 + 5i)$



47. $-2i(8 - 2i)$



48. $(7 + 3i)(4 - 8i)$



49. $(3 + 9i)(3 - 9i)$



50. $-6i^{18}$



51. $(-4i)^9$

52. i^{44}