

Taken from § 8.2 in the text.

1. Compared to the graph of $f(x) = x^2$, the graph of $g(x) =$ _____ is shifted upward 2 units.
3. The vertex of $f(x) = (x - 1)^2 + 2$ is _____.
5. A quadratic function f may be written in 2 different forms. What are they?
7. The graph of $f(x) = -x^2$ is a parabola that opens _____. We say that this parabola has what kind of concavity?

In exercises 9 - 27 odd, (a) sketch the graph of the equation, (b) identify the vertex, (c) compare the graph to the graph of $f(x) = x^2$ by stating any transformations used.

9. $f(x) = x^2 - 4$

11. $f(x) = 2x^2 + 1$

13. $f(x) = (x - 3)^2$

15. $f(x) = -x^2$

17. $f(x) = 2 - x^2$

19. $f(x) = (x + 2)^2$

21. $f(x) = (x + 1)^2 - 2$

23. $f(x) = (x - 1)^2 + 2$

25. $f(x) = 2(x - 5)^2 - 4$

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

In exercises 29 and 31, compare the graph of $y = f(x)$ to the graph of $\text{square}(x) = x^2$. The sketch a graph of $y = f(x)$ and $\text{square}(x) = x^2$ in the same xy -plane.

29. $f(x) = \frac{1}{2}(x - 1)^2 - 2$

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

In exercises 35 and 37, write the vertex form of a parabola that satisfies the conditions given. Then write the equation in the form $f(x) = ax^2 + bx + c$.

35. Vertex (3,4) and $a = 3$.

37. Vertex (5,-2) and $a = -\frac{1}{2}$.

In exercises 39 and 41, write the vertex form of a parabola that satisfies the conditions given. Assume that $a = \pm 1$.

39. Concave up, vertex (1,2).

41. Concave down, vertex (0,-3).

In exercises 43 and 45, refer to the graphs in the text to determine the vertex form of the parabola shown. Assume that $a = \pm 1$.

bigskip

43.

45.

In exercises 47 - 59 odd, complete the square to rewrite the function in vertex form. Then identify the vertex.

47. $f(x) = x^2 + 2x - 3$

49. $f(x) = x^2 - 4x + 5$

51. $f(x) = x^2 + 3x - 2$

53. $f(x) = x^2 - 7x + 1$

55. $f(x) = 3x^2 + 6x - 1$

57. $f(x) = 2x^2 - 3x$

59. $f(x) = -2x^2 - 8x + 5$

In exercises 61 and 63, find a value for the constant a so that $f(x) = ax^2$ models the data. If you are uncertain about your value for a , check it by making a table of values.

61.

x	1	2	3
$f(x)$	2	8	18

63.

x	2	4	6	8
$f(x)$	1.2	4.8	10.8	19.2