

2 Chapter Review WITH CalcChat®



Chapter Learning Target

Understand quadratic functions.

Chapter Success Criteria

- ◆ I can describe transformations of quadratic functions.
 - ◆ I can identify characteristics of quadratic functions.
 - I can write equations of parabolas.
 - I can model with quadratic functions.
- ◆ Surface
■ Deep

SELF-ASSESSMENT 1 I do not understand. 2 I can do it with help. 3 I can do it on my own. 4 I can teach someone else.

2.1 Transformations of Quadratic Functions (pp. 45–52)



Learning Target: Describe and graph transformations of quadratic functions.

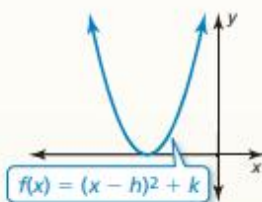
Describe the transformation of $f(x) = x^2$ represented by g . Then graph each function.

1. $g(x) = (x + 4)^2$
2. $g(x) = -\frac{1}{5}x^2$
3. $g(x) = (x - 7)^2 + 2$
4. $g(x) = -3(x + 2)^2 - 1$

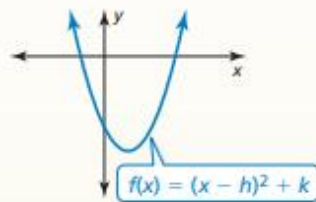
Write a rule for g .

5. The graph of g is a horizontal shrink by a factor of $\frac{2}{3}$, followed by a translation 5 units left and 2 units down of the graph of $f(x) = x^2$.
6. The graph of g is a translation 2 units left and 3 units up, followed by a reflection in the y -axis of the graph of $f(x) = x^2 - 2x$.
7. For each graph, determine whether h and k are *positive*, *negative*, or *zero*. Explain.

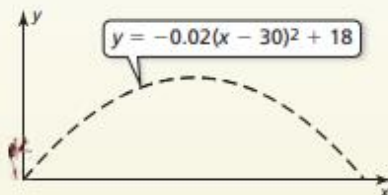
a.



b.



8. The graph represents the path of a football kicked by a player, where x is the horizontal distance (in yards) and y is the height (in yards). The player kicks the ball a second time so that it travels the same horizontal distance, but reaches a maximum height that is 6 yards greater than the maximum height of the first kick. Write a function that models the path of the second kick.



Vocabulary



quadratic function
parabola
vertex of a parabola
vertex form

2.4

Modeling with Quadratic Functions (pp. 71–78)

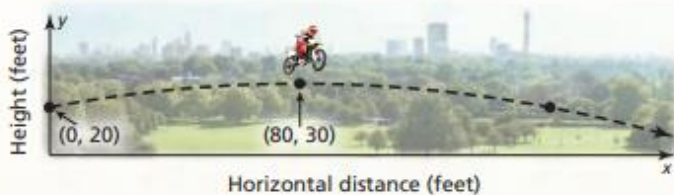


GO DIGITAL

Learning Target: Write equations of quadratic functions using given characteristics.

Write an equation of the parabola with the given characteristics.

23. passes through (1, 12) and has vertex (10, -4)
24. passes through (4, 3) and has x -intercepts -1 and 5
25. passes through (-2, 7), (1, 10), and (2, 27)
26. The graph shows the parabolic path of a stunt motorcyclist jumping off a ramp, where y is the height (in feet) and x is the horizontal distance traveled (in feet). Write an equation of the parabola. The motorcyclist lands on another ramp 160 feet from the first ramp. What is the height of the second ramp?



27. The table shows the heights y of a dropped object after x seconds. Verify that the data show a quadratic relationship. Write a function that models the data. How long is the object in the air?

Time (seconds), x	0	0.5	1	1.5	2	2.5
Height (feet), y	150	146	134	114	86	50

28. The table shows the average total stopping distances of a vehicle on dry pavement at different speeds.

Speed (miles per hour), x	20	30	40	55	65	70
Total stopping distance (feet), y	63	119	164	265	344	387

- a. Use technology to write a function that models the data.
- b. Estimate the total stopping distance of a vehicle traveling 45 miles per hour.

Mathematical Practices

Make Sense of Problems and Persevere in Solving Them

Mathematically proficient students consider analogous problems.

1. How did understanding transformations of linear functions help you to understand transformations of quadratic functions?
2. In Exercise 41 on page 59, you explained why you cannot use the axes of symmetry to distinguish between two quadratic functions whose graphs have vertices (2, 4) and (2, -3). Similarly, explain why you cannot use y -intercepts to distinguish between two linear functions whose graphs pass through the point (0, 2).
3. Complete the statement below. Explain your reasoning.

The point $(-3, -1)$ on the graph of $y = (x + 3)^2 - 1$ is similar to the point _____ for the graph on $x = (y + 3)^2 - 1$.