

GUIDED PRACTICE

Vocabulary Check ✓

1. Complete this statement: When you perform quadratic regression on a set of data, the quadratic model you obtain is called the ?.

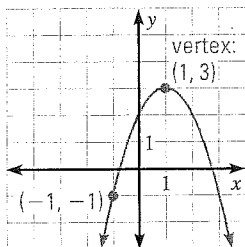
Concept Check ✓

2. How many points are needed to determine a parabola if one of the points is the vertex? if none of the points is the vertex?

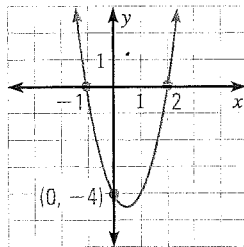
Skill Check ✓

Write a quadratic function in the specified form for the parabola shown.

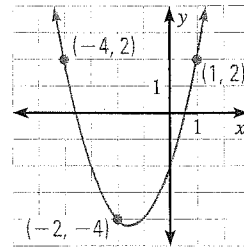
3. vertex form



4. intercept form



5. standard form



6. **REAL ESTATE** The table shows the average sale price p of a house in Suffolk County, Massachusetts, for various years t since 1988. Use a system of equations to write a quadratic model for the data. Check your model by performing quadratic regression on a graphing calculator.

Years since 1988, t	0	2	4	6	8	10
Average sale price (thousands of dollars), p	165	154.5	124.5	115	128	165



DATA UPDATE of *Boston Globe* data at www.mcdougallittell.com

PRACTICE AND APPLICATIONS

STUDENT HELP

→ **Extra Practice** to help you master skills is on p. 947.

STUDENT HELP

→ HOMEWORK HELP

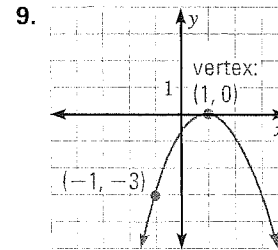
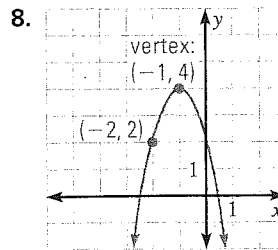
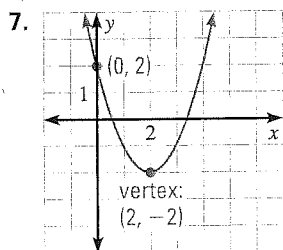
Example 1: Exs. 7–15, 34

Example 2: Exs. 16–24, 35

Example 3: Exs. 25–33, 36–38

Example 4: Exs. 37, 38

WRITING THE VERTEX FORM Write a quadratic function in vertex form for the parabola shown.



WRITING THE VERTEX FORM Write a quadratic function in vertex form whose graph has the given vertex and passes through the given point.

10. vertex: (2, -1)
point: (4, 3)

11. vertex: (-4, 6)
point: (-1, 9)

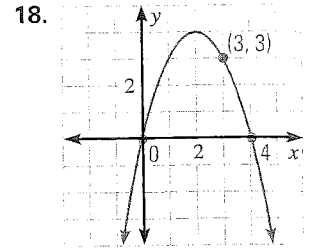
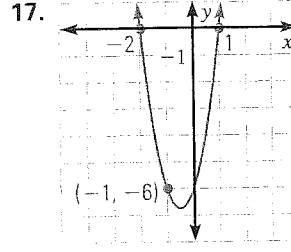
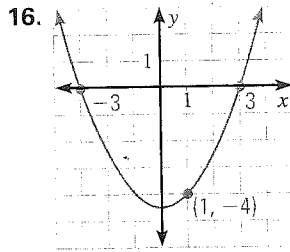
12. vertex: (4, 5)
point: (8, -3)

13. vertex: (0, 0)
point: (-2, -12)

14. vertex: (1, -10)
point: (-3, 54)

15. vertex: (-6, -7)
point: (0, -61)

WRITING THE INTERCEPT FORM Write a quadratic function in intercept form for the parabola shown.



WRITING THE INTERCEPT FORM Write a quadratic function in intercept form whose graph has the given x -intercepts and passes through the given point.

19. x -intercepts: 1, 4
point: (3, 2)

20. x -intercepts: -2, 2
point: (-4, 8)

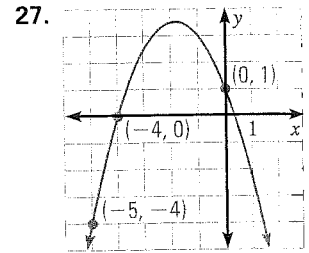
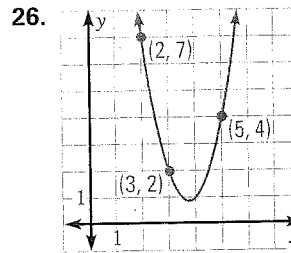
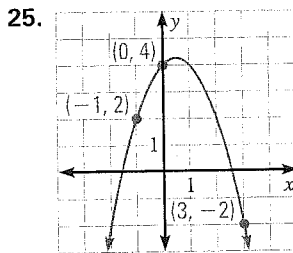
21. x -intercepts: -1, 6
point: (1, -20)

22. x -intercepts: -10, -8
point: (-7, -15)

23. x -intercepts: 3, 9
point: (14, 77)

24. x -intercepts: -5, 0
point: (-3, 18)

WRITING THE STANDARD FORM Write a quadratic function in standard form for the parabola shown.



WRITING THE STANDARD FORM Write a quadratic function in standard form whose graph passes through the given points.

28. (-1, 5), (0, 3), (3, 9)

29. (1, 2), (3, 4), (6, -8)

30. (-2, -1), (1, 11), (2, 27)

31. (-4, -7), (-3, 3), (3, -21)

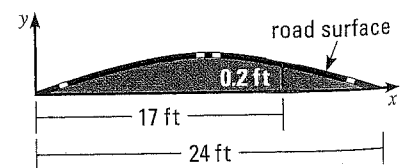
32. (-3, -4), (-1, 0), (9, -10)

33. (-6, 46), (2, 14), (4, 56)

34. **BOTANY** *Amaranth* is a type of vegetable commonly grown in Asia, West Africa, and the Caribbean. When amaranth plants are grown in rows, the height that the plants attain is a quadratic function of the spacing between plants within a row. According to one study, the minimum height of the plants, about 16 cm, occurred when the plants were spaced about 27 cm apart. The study also found that the plants grew to about 20 cm when spaced about 40 cm apart. Write a quadratic model giving the plant height h as a function of the spacing s .

► Source: Center for New Crops and Plant Products, Purdue University

35. **TRANSPORTATION** The surfaces of some roads are shaped like parabolas to allow rain to run off to either side. (This is also true of football fields; see Exercise 52 on page 254.) Write a quadratic model for the surface of the road shown.



Not drawn to scale

► Source: Massachusetts Highway Department

STUDENT HELP

INTERNET **HOMEWORK HELP**
Visit our Web site
www.mcdougallittell.com
for help with problem
solving in Exs. 34 and 35.