

Name \_\_\_\_\_

Date \_\_\_\_\_

LESSON  
4.1

## Practice

For use with pages 236–244

For the following functions (a) tell whether the graph *opens up* or *opens down*, (b) find the vertex, and (c) find the axis of symmetry.

1.  $y = -3x^2 + 1$

2.  $y = -2x^2 - 1$

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

4.  $y = -4x^2 - 2x + 9$

5.  $y = 5x^2 - 5x + 7$

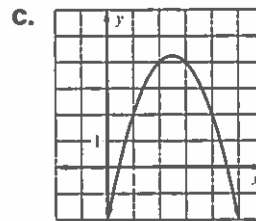
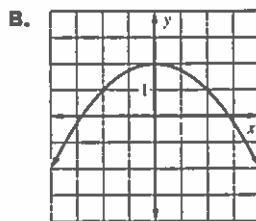
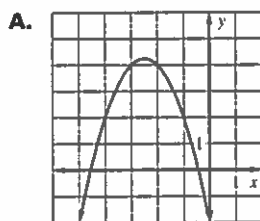
6.  $y = -2x^2 - 3x + 3$

Match the equation with its graph.

7.  $y = -x^2 + 5x - 2$

8.  $y = -x^2 - 5x - 2$

9.  $y = -\frac{1}{4}x^2 + 2$



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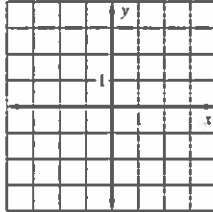
Name \_\_\_\_\_

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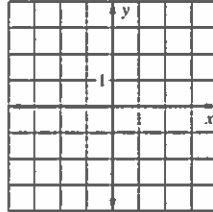
**LESSON**  
**4.1** **Practice** *continued*  
*For use with pages 236–244*

**Graph the function. Label the vertex and axis of symmetry.**

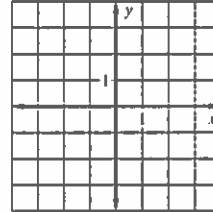
10.  $y = x^2 - 3$



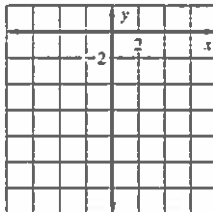
11.  $y = -2x^2 + 4x$



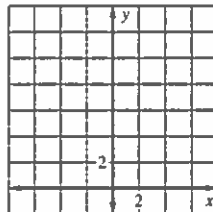
12.  $y = 2x^2 + 6x + 1$



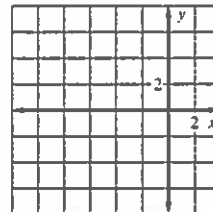
13.  $y = 4x^2 - 16x + 3$



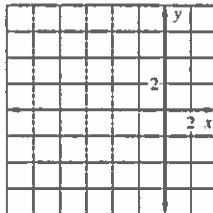
14.  $y = -3x^2 - 12x + 1$



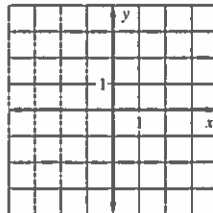
15.  $y = \frac{1}{3}x^2 + 2x - 1$



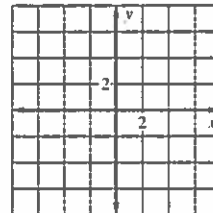
16.  $y = x^2 + 5x - 1$



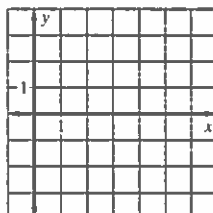
17.  $y = 3x^2 + 3x - 2$



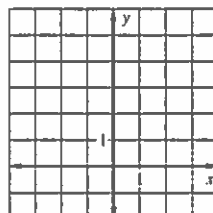
18.  $y = -5x^2 + 4x + 2$



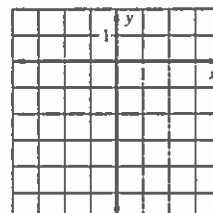
19.  $y = -\frac{1}{2}x^2 + 3x - 1$



20.  $y = -2x^2 - 4x + 3$



21.  $y = 2x^2 - 4x - 2$



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**LESSON**  
**4.1** **Practice** *continued*  
*For use with pages 236–244*

**In Exercises 22–24, use the following information.**

**Minimize Cost** A baker has modeled the monthly operating costs for making wedding cakes by the function  $y = 0.5x^2 - 12x + 150$  where  $y$  is the total cost in dollars and  $x$  is the number of cakes prepared.

22. Find the vertex and axis of symmetry.
23. What is the minimum cost?
24. How many cakes should be prepared each month to yield the minimum cost?

**In Exercises 25 and 26, use the following information.**

**Maximize Revenue** A sports store sells about 50 mountain bikes per month at a price of \$220 each. For each \$20 decrease in price, about 10 more bikes per month are sold.

25. Write a quadratic function in standard form that models the revenue from bike sales.
26. What price produces the maximum revenue?