Name _____ Date _____

Practice 7

For use with Section 1-7

For each quadratic function in Exercises 1–9:

a. Tell whether the function has a maximum value or a minimum value.

b. Find the value of x that maximizes or minimizes the function.

c. Find the function's maximum or minimum value.

1. $y = x^2 - 8x + 12$

2. $y = x^2 + 2x - 15$

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

4. $y = -3x^2 + 18x + 2$

5. $y = -1.5x^2 + 6x - 1$

6. $y = 1.6x^2 - 16x$

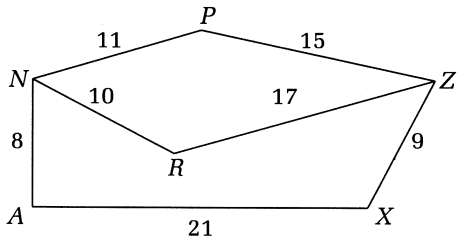
7. $y = -5x^2 + 35x - 8$

8. $y = 0.4x^2 + 2x - 3$

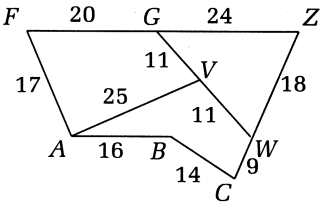
9. $y = -\frac{1}{2}x^2 + \frac{3}{2}x + 6$

For each network diagram, find the shortest route from vertex A to vertex Z.

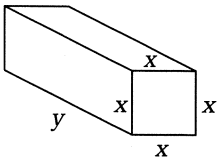
10.



11.



12. The size of a rectangular package that the U.S. Postal Service will deliver is limited as follows: The total of the length and the girth (the perimeter of a cross-section perpendicular to the length) of the package can be at most 108 in. Suppose a package has exactly this total of length and girth, and suppose that the girth is the perimeter of a square, as shown.



a. Write an equation that expresses the fact that the total of girth and length is 108 in.

b. Express the volume V of the package as a function of x and y.

c. Use the equation you found in part (a) to express V as a function of x alone.

d. Use a graphics calculator to graph the function you found in part (c). What value of x maximizes the volume V of the package? What is the maximum volume?