Assignment

Write

1. Describe the characteristics of a quadratic function that you can determine from its equation in general form.

2. Describe the characteristics of a quadratic function that you can determine from its equation in factored form.

Remember

The sign of the leading coefficient of a quadratic function in standard form or factored form describes whether the function has an absolute maximum or absolute minimum.

A parabola is a smooth curve with reflectional symmetry. The axis of symmetry contains the vertex of the graph of the function, which is located at the absolute minimum or absolute maximum of the function.

Practice

1. Analyze each quadratic function.

$$g(x) = 12x - 4x^2 + 16 \qquad h(x) = -\frac{1}{4}(x - 3)(x + 2)$$

   a. Identify the quadratic function as general form or factored form.
   b. Does the quadratic function have an absolute maximum or absolute minimum?
   c. Does the graph open upward or downward?
   d. Determine any intercepts from the given form of the function.

2. Analyze each quadratic function.

$$f(x) = -\frac{2}{3}x^2 - 3x + 15 \qquad g(x) = \frac{3}{4}x^2 + 12x - 27$$

   a. Identify the axis of symmetry.
   b. Use the axis of symmetry to determine the ordered pair of the absolute maximum or absolute minimum value.
   c. Describe the intervals of increase and decrease.
   d. Sketch the graph based on the information you just calculated.
   e. Use technology to identify the zeros.
   f. Place two pairs of symmetric points on your graph. What is the average rate of change between these pairs of symmetric points?
   g. Write the function in factored form.

3. Given a parabola that opens downward and has zeros at $x = -2$ and $x = 3$.
   a. Represent it as a quadratic equation in factored form.
   b. Sketch a graph of the quadratic function.
   c. What is the axis of symmetry and y-intercept of the quadratic function?

Stretch

1. Sketch the graph $f(x) = -3x^2 - 4$. How could you change the quadratic function to make the graph open upward? Show the change on the graph.
2. How could you change the quadratic function $f(x) = -3x^2 - 4$ to shift the graph up or down? Show on the graph.
3. How could you change the quadratic function $f(x) = -3x^2 - 4$ to shift the graph right or left? Show the change on the graph.

Review

1. A camp wants to create a larger space for their albino rabbit, Clover. They want to reuse the materials from Clover's current enclosure in the construction of the new enclosure. The perimeter of Clover's current space is 6 feet. The perimeter of his new enclosure will be 3 times larger than his former enclosure.
   a. What is the area of the new enclosure $A(w)$ in terms of width, w?
   b. What is the maximum area of the new enclosure? What are the dimensions?
2. Is $7x^{2t} \cdot 5x^{2t}$ equivalent to $35x^{2t}$? Justify your answer.
3. Is $(16^{3z})^{6y}$ equivalent to 16^{18yz}? Justify your answer.
4. Use the marginal frequency distribution to answer each question.

	Favorite Fruit			
	Apples	**Oranges**	**Grapes**	**Total**
Men	10	4	7	21
Women	11	9	8	28
Total	21	13	15	49

   a. Which fruit do men and women prefer overall? Justify your response.
   b. Is the fruit that the men and women like the least also the fruit that just women like the least? Justify your response.