

Berkeley College
GHW #8 Quadratic Functions and Models

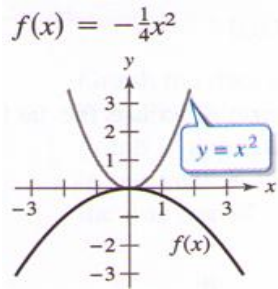
NAME _____

DATE _____

Show all work in the space provided. No credit will be given for answers without work shown.

Describing a Transformation

1. Compare the graph of the quadratic function $y = -\frac{1}{4}x^2$ with the graph of $y = x^2$. 1. _____



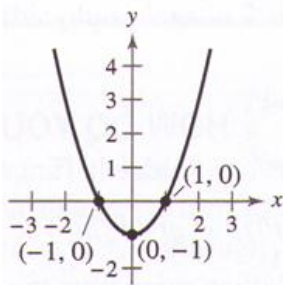
2. Sketch the graph of the quadratic function $y = -\frac{3}{4}x^2$ and compare it with the graph of $y = x^2$. 2. _____

Write the quadratic function in standard form (if necessary) and sketch its graph.
Identify the vertex

3. $h(x) = x^2 - 9$. 3. _____
4. $f(x) = (x - 6)^2 + 3$. 4. _____
5. $f(x) = x^2 + 3x + \frac{1}{4}$ 5. _____

Find an equation of a Parabola

6. 6. _____



7. Find an equation of the parabola that has the indicated vertex and whose graph passes through the given point. Vertex: $(-3, 5)$; point: $(-6, -1)$ 7. _____

Finding the Slope of a Line

8. Find two quadratic functions whose graphs have the given x-intercepts. Find one function whose graph opens upward and another whose graph opens downward.

$$-4, 0), (0, 0)$$

8. _____

9. Find two quadratic functions whose graphs have the given x-intercepts. Find one function whose graph opens upward and another whose graph opens downward.

$$\left(-\frac{5}{2}, 0\right), (-2, 0)$$

9. _____

10. **Optimal Area** The perimeter of a rectangle is 540 feet. Let x represent the width of the rectangle. Write a quadratic function for the area of the rectangle in terms of its width. Find the vertex of the graph of the quadratic function and interpret its meaning in the context of the problem.

10. _____

11. **Optimal Revenue** Find the number of units that produces a maximum revenue. The revenue R is measured in dollars and x is the number of units produced.

$$R = 80x - 0.0001x^2$$

11. _____

12. **Optimal Profit** The daily production costs P (in dollars) for a manufacturer of sound systems is given by the quadratic function

$$P(x) = -0.0003x^2 + 150x - 375,000$$

where x is the number of units produced. What production level will yield a maximum profit?

12. _____

13. **Maximum Height** The path of the winning shot at a shot put event can be approximated by the quadratic function

$$y = -0.011x^2 + 0.65x + 8.3$$

13. _____

where y is the height of the shot (in feet) and x is a horizontal distance (in feet). (See figure). Use the maximum and trace features of a graphing utility to find the maximum height reached by the shot and its winning distance

