

**Graphs of the Quadratic Functions (Parabolas)**

1. Sketch the graph of the following equations

a)  $f(x) = x^2 - 9$

b)  $f(x) = -x^2 + 9$

c)  $f(t) = t^2 + 4t + 4$

d)  $h(t) = 2t^2 + 3t - 2$

**Applications of the Quadratic Functions**

**Q2) Revenue.** Suppose that the manufacturer of a gas clothes dryer has found that when the unit price is  $p$  dollars the revenue  $R$  (in dollars) is  $R(p) = -4p^2 + 4000p$ . What is the largest possible revenue? That is, find the maximum value of the revenue function.

**Q3) Revenue.** A store selling calculators has found that, when the calculators are sold at a price of  $p$  dollars per unit, the revenue  $R$  (in dollars) as a function of the price  $p$  is  $R(p) = -750p^2 + 15000p$ . What is the largest possible revenue? That is, find the maximum value of the revenue function.

**Q4)** Find the minimum value of the quadratic function  $f(x) = 4x^2 - 8x + 3$ .

**Q5)** A company receives \$45 for each unit of output sold. It has a variable cost of \$25 per item and a fixed cost of \$1600. What is its profit if it sells (a) 75 items, (b) 150 items, and (c) 200 items?

**Q6)** Water freezes at 32 degrees Fahrenheit or 0 degrees Celsius and boils at 212 degrees Fahrenheit or 100 degrees Celsius. Find a function converting degrees Celsius to degrees Fahrenheit. Use the function to convert 30 degrees Celsius to degrees Fahrenheit.

**Q7)** A company produces 100 tools for \$125,500 and the cost of producing 101 tools is \$126,700.  
a) Write the cost function  $C(x)$ , assuming it is linear.  
b) Find and interpret the slope of the graph of  $C$ .