

#### 4.4 Practice Problems

1. The marketing department at a electronics company has found that, when certain tablets are sold at a price of  $p$  dollars per unit, the number  $x$  of tablets sold is given by the demand equation

$$x = 35000 - 100p$$

- a. Find a model that expresses the revenue  $R$  as a function of the price  $p$ .
- b. What is the domain of  $R$ ?
- c. What unit price should be used to maximize revenue?
- d. If this price is charged, what is the maximum revenue?
- e. How many units are sold at this price?
- f. Graph  $R$ .
- g. What price should the electronics company charge to collect at least \$2,000,000 in revenue?

2. You have 80 yards of fencing to enclose a rectangular region. Find the dimensions of the rectangle that maximize the enclosed area. What is the maximum area?

3. A person standing close to the edge on the top of a 96 foot building throws a baseball vertically upward. The quadratic function

$$s(t) = -16t^2 + 16t + 96$$

models the ball's height above the ground,  $s(t)$ , in feet,  $t$  seconds after it was thrown.

a. After how many seconds does the ball reach its maximum height? What is the maximum height?

b. How many seconds does it take until the ball finally hits the ground?

c. Find  $s(0)$  and describe what this means.