

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Row: \_\_\_\_\_ Period: \_\_\_\_\_

## **NOTES SECTION 4.7: OPTIMIZATION PROBLEMS – DAY 2**

### **EXAMPLE I**

A man launches his boat from point A on a bank of a straight river, \_\_\_\_\_ wide, and wants to reach point B, 8 km downstream on the opposite bank, as quickly as possible. If he can row 6 km/hr and run 8 km/hr, where should he land to reach B as soon as possible? (We assume the speed of the water is negligible compared with the speed at which the man rows.)

**EXAMPLE 2**

Find the area of the largest rectangle that can be inscribed in a semicircle of radius  $r$ .

**cost function:**

**marginal cost:**

**demand function (or price function):**

**revenue function:**

**marginal revenue function:**

**profit function:**

**marginal profit function:**

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### **EXAMPLE 3**

A store has been selling 200 DVD burners a week at \$350 each. A market survey indicates that for each \$10 rebate offered to buyers, the number of units sold will increase by 20 a week. Find the demand function and the revenue function. How large a rebate should the store offer to maximize its revenue?

**EXAMPLE 4**

Find the dimensions of the rectangle of largest area that has one vertex at  $(0,0)$ , one vertex lying on

the graph of  $f(x) = \frac{4-x}{x+2}$ , and is in the first quadrant.