

Name \_\_\_\_\_

Homework 11  
section 2.4

Answers for this assignment should be in complete, grammatically correct (English) sentences, and include explanations whenever appropriate.

1. (2 ea) An economist is interested in how the price of a certain item affects its sales. At a price of  $\$p$ , a quantity  $q$  of the item is sold. If  $q = f(p)$ , determine whether each of the following statements make sense. If so, explain what they mean, if not, say why not.

(a)  $f(150) = 2000$

(b)  $f(150) = -25$

(c)  $\left. \frac{dq}{dp} \right|_{p=150} = 25$

(d)  $f'(150) = -25$

2. (2,4,4,1,1) A company's revenue,  $R$  (in thousands of dollars), from sombrero sales, is a function of advertising expenditure,  $a$  (in thousands of dollars), so  $R = f(a)$ .

(a) What does the company hope is true about the sign of  $f'$ ? [Be sure to give a reason in support of your answer.]

(b) What does the statement  $f'(200) = 2$  mean in practical terms?  
How about  $f'(200) = -0.5$ ?

(c) Suppose the company plans to spend about \$200,000 dollars on advertising. If  $f'(200) = 2$ , should the company spend more or less than \$200,000 on advertising?  
What if  $f'(200) = .75$ ?

(d) What are the units of  $f'$ ?

(e) Rewrite the expression  $f'(200) = 2$  in the alternative "Leibniz notation".