

Name _____

Homework 4
Section 2.4

Answers for this assignment (numbers 1 and 2) should be in complete, grammatically correct (English) sentences, and include explanations whenever appropriate.

1. (2ea) 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 in real world terms. 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. (4ea) 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) Suppose the company plans to spend about \$100,000 dollars on advertising. If $f'(100) = 2$, should the company spend more or less than \$100,000 on advertising?

(b) Suppose the company plans to spend about \$100,000 dollars on advertising. If $f'(100) = .75$, should the company spend more or less than \$100,000 on advertising?

3. (2ea) For a particular painkiller, the size of the dose, Q , given depends on the weight of the patient, w . Thus, $Q = f(w)$, where Q is in milligrams and w is in pounds.

(a) What are the units of f' ?

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