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 *practical, real world terms*. If so, explain what they mean, if not, say why not.

   (a) $f(150) = 2000$

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

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

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

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

   (a) Suppose the company plans to spend about $\$80,000$ dollars on advertising. If $f'(80) = 2$, should the company spend more or less than $\$80,000$ on advertising? Explain.

   (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? Explain.

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 $f'(w)$?

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