Name _____

Homework 9
Sections 14.1 & 14.2

1. (1ea) The monthly payment on a home loan is a function, $P(A, r, n)$, of the amount of the loan, A, the interest rate, r, and the number of years of the loan, n.

   (a) Is $\frac{\partial P}{\partial A}$ positive or negative? Why?

   (b) Is $P_n(A, r, n)$ positive or negative? Why?

2. (5) Let $Q = 3r^2t^3 - \ln\left(\frac{r-t}{r+t}\right) + \cos(5r + 8t)$. Compute $\frac{\partial Q}{\partial t}$.

3. (4ea) Consider the function $g(x, y, z) = \dfrac{xyz}{4^x + y^y + z^2}$. Compute the following quantities:

   (a) $g_x(1, 3, -2)$

   (b) $\left.\dfrac{\partial g}{\partial z}\right|_{(1,3,-2)}$

4. (5) Is there a function f which has the following partial derivatives? If so, what is it? Are there others? If not, why not?

$$f_x(x,y) = x^2 + xy^2\cos x + y^2\sin x \qquad\qquad f_y(x,y) = 2xy\sin x + y^2$$