Homework Sections 6.3.
Due Thursday, November 9

I. This question refers to problem #41 on page 349, which uses research published in a journal called *Archives of Disease in Children* in 1997.

A. What are the units on w, R(w), and R'(w)?

B. Do part (a). Don't forget that the log is base 10, so when you differentiate, use the appropriate formula. After you use implicit differentiation, solve for R'(w). Your answer will have an R(w) in it. Substitute in the simplified version of R(w) that you found in part B above to complete your answer.

C. Do part (b). Solve for R(w) by raising 10 to the power of each side of the equation, and differentiate using the chain rule (carefully).

D. Write a paragraph to answer the question in part (c), including each of the following.

1. Briefly explain the steps to finding R'(w) in each case.
2. For this problem, which method is more efficient, and why?
3. In problems #1-18 on page 347, an equation with variables x and y is given, and the question is to find dy/dx. Make up two example problems of this form, one in which it is easier to find dy/dx by solving for y and then differentiating, and one in which it is easier to find dy/dx by using implicit differentiation and then solving for dy/dx.

E. By the way: The formula for R(w) in this problem is not written in the simplest way. Solve for R(w) and then use the laws of logs and exponents to put your answer in the form $R(w)=Kw^m$ where K and m are numbers. Now find R'(w), using the power rule.

II. The equation for a circle centered at the origin with radius 6 is $x^2 + y^2 = 36$.

A. Find the points on the circle with x coordinate equal to 4. In other words, find y so that $(4,y)$ satisfies the equation of the circle.

B. Write the equation for the tangent line at each of the points you found in part (A).

C. Draw a graph of the circle and the tangent lines. Label the points and the y-intercepts of the tangent lines with their coordinates.