1. Find the derivative of each of the following using the Product or Quotient Rules as appropriate. Show your work. Don't simplify unless you are asked to.

   a. $y = (1+3x)(1+5x)$

   b. $y = \left(1 + 2\sqrt[4]{x^3} + 3x^3\right)\left(1 + \frac{1}{5x^2} + 8x^2\right)$

   c. $y = (1+3x)(x^3+5x)(2+3x-2x^7)$ Hint: You will need to apply the Product Rule twice.

   d. $y = \frac{1+3x}{1+5x}$; simplify the numerator of the derivative.

   e. $y = \frac{x^3}{1+5x}$; simplify the numerator of the derivative.

2. For $n \in R$, find the derivative of $y = \frac{1}{x^n}$ by 1) using the Quotient Rule (simplify completely) and by 2) using the Power Rule. Which way is easier?

3. Find the derivative of $y = \frac{1+5x}{x^3}$ by 1) using the Quotient Rule (simplify completely) and by 2) simplifying the function first into two fractions and then using the Power Rule on each fraction. Which way is easier? <u>You should get the same derivative each way.</u>