1) Use the difference quotient to find $f'(a)$ in each of the examples below
   
   a. $f(x) = x^2$

   b. $f(x) = x^3$

   c. $f(x) = x^4$

2) Argue that if $g(x) = x^{10}$, we could use the difference quotient to show $g'(a) = 10a^9$ (don’t actually do it). It may help to note that the coefficients of a binomial expansion are given by Pascal’s Triangle. (see: http://www.math10.com/en/algebra/probabilities/binomial-theorem/binomial-theorem.html)