1. Let $f(x) = 5x^2$.

   (a) Find the average rate of change of f from $x = 3$ to $x = 4$.

   (b) Find the average rate of change of f from $x = 3$ to $x = 3 + h$. Note: your answer should involve h, and when $h = 1$, your answer should simplify to your answer in part (a).

   (c) As h gets smaller and smaller, what happens to the average rate of change of f from $x = 3$ to $x = 3 + h$?

   (d) Find the instantaneous rate of change of f at $x = 3$.

2. Let $f(x) = 2x^2$.

   (a) Find the average rate of change of f over the interval $[-1, 1]$.

   (b) Find the average rate of change of f over the interval $[x, x + h]$. Note: your answer should involve x and h. When $x = -1$ and $h = 2$, your answer should simplify to your answer in part (a).

   (c) As h gets smaller and smaller, what happens to the average rate of change of f over the interval $[x, x + h]$?

   (d) Find $f'(x)$.