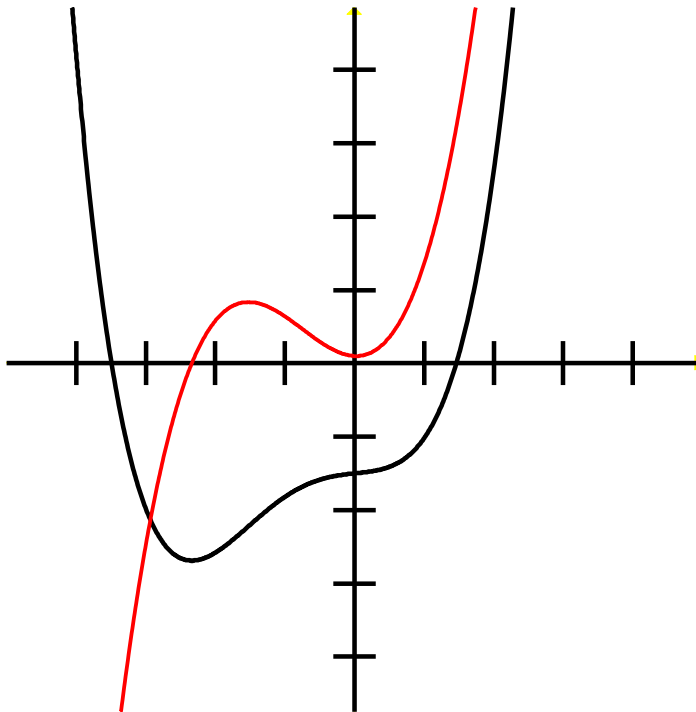1) Given the graph of $y = f(x)$ below, sketch the graph of $f'(x)$ on the same axis.

2) The distance travelled by of a bicyclist traveling down a hill is given by $f(x) = 3x^2$ feet at time x, where s is measured in seconds. Velocity is the rate of change of distance. Use the appropriate ideas we've learned in class thus far to find the velocity function of the bicyclist.

$$f'(x) = \lim_{h \to 0} \frac{3(x+h)^2 - 3x^2}{h} = \lim_{h \to 0} \frac{3(x^2 + 2xh + h^2) - 3x^2}{h} = \lim_{h \to 0} \frac{3x^2 + 6xh + 3h^2 - 3x^2}{h}$$

$$= \lim_{h \to 0} \frac{6xh + 3h^2}{h} = \lim_{h \to 0} 6x + 3h = 6x$$

$$f'(x) = 6x \text{ feet per second}$$