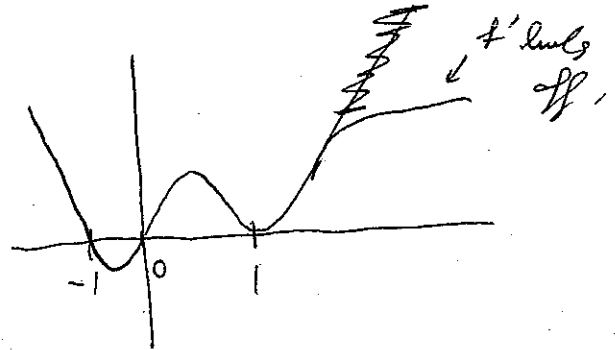
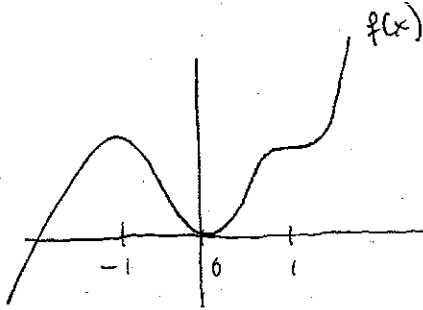


KEY

Math 125-Quiz 12¹ September 30, 2011

You have ten minutes to complete this quiz.

1. Given the graph below of $f(x)$, draw the graph of $f'(x)$.



2. Let $f(x) = x^2 + 3x$. Find $f'(x)$.

$$\begin{aligned} f'(x) &= \lim_{h \rightarrow 0} \frac{(x+h)^2 + 3(x+h) - (x^2 + 3x)}{h} \\ &= \lim_{h \rightarrow 0} \frac{x^2 + 2hx + h^2 + 3x + 3h - x^2 - 3x}{h} = \lim_{h \rightarrow 0} \frac{2xh + h^2 + 3h}{h} = \lim_{h \rightarrow 0} 2x + h + 3 \\ &= \boxed{2x + 3} \end{aligned}$$

3. Let $f(x) = \frac{1}{x}$. Find $f'(x)$.

$$\begin{aligned} f'(x) &= \lim_{h \rightarrow 0} \frac{\frac{1}{x+h} - \frac{1}{x}}{h} = \lim_{h \rightarrow 0} \frac{\frac{x}{x(x+h)} - \frac{(x+h)}{x(x+h)}}{h} \\ &= \lim_{h \rightarrow 0} \frac{x - x - h}{h(x(x+h))} = \lim_{h \rightarrow 0} \frac{-1}{x(x+h)} = \boxed{\frac{-1}{x^2}} \end{aligned}$$

¹You are excused to leave when you're finished with this quiz.