Calculus 12
5-2 Questions

1. Each of the following limits represents the derivative of some function f at some number a. State f and a in each case.

a) $\lim_{h \to 0} \frac{(3+h)^2 - 3^2}{h}$

b) $\lim_{h \to 0} \frac{(2+h)^3 - 8}{h}$

c) $\lim_{h \to 0} \frac{\sqrt{4+h} - 2}{h}$

d) $\lim_{h \to 0} \frac{\left[(1+h)^4 + 3(1+h)\right] - 4}{h}$

e) $\lim_{h \to 0} \frac{2^{1+h} - 2}{h}$

f) $\lim_{x \to 1} \frac{x^5 - 1}{x - 1}$

2. If $f(x) = x^2 + 7x$, find $f'(3)$.

3. If $f(x) = \frac{1}{x}$, find $f'(3)$ and use it to find the equation of the tangent to the curve $y = \frac{1}{x}$ at the point $\left(3, \frac{1}{3}\right)$.