PROPERTIES OF LIMITS

Suppose that $\lim_{x\to c} f(x) = L$ and that $\lim_{x\to c} g(x) = K$,

1. $n * \lim_{x\to c} f(x) = \lim_{x\to c} n * f(x) = n * L$
2. $\lim_{x\to c} [f(x)] \pm \lim_{x\to c} [g(x)] = \lim_{x\to c} [f(x) \pm g(x)] = L \pm K$
3. $\lim_{x\to c} [f(x) * g(x)] = \lim_{x\to c} [f(x)] * \lim_{x\to c} [g(x)] = L * K$
4. $\lim_{x\to c} \left[\frac{f(x)}{g(x)}\right] = \frac{\lim_{x\to c} [f(x)]}{\lim_{x\to c} [g(x)]} = \frac{L}{K}$, provided $\lim_{x\to c} [g(x)] \neq 0$
5. $\lim_{x\to c} [f(x)]^n = \left[\lim_{x\to c} f(x)\right]^n = L^n$, where n is any real number
6. $\lim_{x\to c} a = a$, a is any real number
7. $\lim_{x\to c} x = c$
8. $\lim_{x\to c} x^n = c^n$

1. Evaluate the following limit using *only* the properties above

$$\lim_{x\to -2} \left(3x^2 + 5x - 9\right)$$

Now note that if defined $p(x) = 3x^2 + 5x - 9$ and evaluated $\lim_{x\to -2} p(x)$ a quick direct substitution would have yielded that our limit equals $p(-2) = -7$