# Math For Biz Handout - Limit Laws & Special Limits

12/3/14

**Note:** In all of these below $n$ = positive integer and $c$ = constant number

**Limit Laws:**

1. $\lim_{x\to a}\Big[f(x)+g(x)\Big] = \lim_{x\to a} f(x) + \lim_{x\to a} g(x)$
2. $\lim_{x\to a}\Big[f(x)-g(x)\Big] = \lim_{x\to a} f(x) - \lim_{x\to a} g(x)$
3. $\lim_{x\to a}\Big[c\cdot f(x)\Big] = c\cdot \lim_{x\to a} f(x)$
4. $\lim_{x\to a}\Big[f(x)\cdot g(x)\Big] = \lim_{x\to a} f(x)\cdot \lim_{x\to a} g(x)$
5. $\lim_{x\to a}\left[\dfrac{f(x)}{g(x)}\right] = \dfrac{\lim_{x\to a} f(x)}{\lim_{x\to a} g(x)}$
6. $\lim_{x\to a}\Big[f(x)\Big]^n = \Big[\lim_{x\to a} f(x)\Big]^n$
7. $\lim_{x\to a}\sqrt[n]{f(x)} = \sqrt[n]{\lim_{x\to a} f(x)}$

**Special Limits:** (AKA: These are easy enough to memorize)

1. $\lim_{x\to a} c = c$
2. $\lim_{x\to a} x = a$
3. $\lim_{x\to a} x^n = a^n$
4. $\lim_{x\to a}\sqrt[n]{x} = \sqrt[n]{a}$ (provided $a > 0$)