The 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. $\lim_{x\to a}\big(f(x)g(x)\big)=\lim_{x\to a}f(x)\cdot\lim_{x\to a}g(x)$

4. $\lim_{x\to a}\big(cf(x)\big)=c\lim_{x\to a}f(x)$

5. $\lim_{x\to a}\frac{f(x)}{g(x)}=\frac{\lim_{x\to a}f(x)}{\lim_{x\to a}g(x)}$ if $\lim_{x\to a}g(x)\neq 0$

6. $\lim_{x\to a}\big(f(x)\big)^n=\Big(\lim_{x\to a}f(x)\Big)^n$

7. $\lim_{x\to a}c=c$

8. $\lim_{x\to a}x=a$

9. $\lim_{x\to a}x^n=a^n$

10. $\lim_{x\to a}\sqrt[n]{x}=\sqrt[n]{a}$ where n is a positive integer

11. $\lim_{x\to a}\sqrt[n]{f(x)}=\sqrt[n]{\lim_{x\to a}f(x)}$ where n is a positive integer

12. **(Direct Substitution Property)** **<u>If</u>** f is a polynomial or a rational function and a is in the domain of f, **<u>then</u>** $\lim_{x\to a}f(x)=f(a)$

13. **<u>If</u>** $f(x)\le g(x)$ when x is near a, **<u>then</u>** $\lim_{x\to a}f(x)\le\lim_{x\to a}g(x)$

14. **(The Squeeze Theorem)** **<u>If</u>** $f(x)\le g(x)\le h(x)$ when x is near a **<u>and</u>** $\lim_{x\to a}f(x)=\lim_{x\to a}h(x)=L$, **<u>then</u>** $\lim_{x\to a}g(x)=L$ as well