$\lim_{x \to c} f(x) = L$ $\lim_{x \to c} g(x) = M$ L an M are both real

1. $\lim_{x \to c} k = k$

2. $\lim_{x \to c} x = c$

3. $\lim_{x \to c} [f(x) + g(x)] = \lim_{x \to c} f(x) + \lim_{x \to c} g(x) = L + M$

4. $\lim_{x \to c} [f(x) - g(x)] = \lim_{x \to c} f(x) - \lim_{x \to c} g(x) = L - M$

5. $\lim_{x \to c} k \cdot f(x) = k \cdot \lim_{x \to c} f(x) = k \cdot L$

6. $\lim_{x \to c} [f(x) \cdot g(x)] = \lim_{x \to c} f(x) \cdot \lim_{x \to c} g(x) = L \cdot M$

7. $\lim_{x \to c} \frac{f(x)}{g(x)} = \frac{\lim_{x \to c} f(x)}{\lim_{x \to c} g(x)} = \frac{L}{M}$ $M \neq 0$

8. $\lim_{x \to c} \sqrt[n]{f(x)} = \sqrt[n]{\lim_{x \to c} f(x)} = \sqrt[n]{L}$ $L > 0$ or n is odd

$$\lim_{x\to 2}(x^3+2x) = \lim_{x\to 2} x^3 + \lim_{x\to 2} 2x = \lim_{x\to 2} x \cdot \lim_{x\to 2} x \cdot \lim_{x\to 2} x + 2\lim_{x\to 2} x$$

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

$$2^3 + 2(2) = 8+4 = 12$$

$\lim_{x\to 2} f(x) = 4$ $\quad$ $\lim_{x\to 2} g(x) = 1$

Find the limit

$$\lim_{x\to 2} \frac{2-f(x)}{3+g(x)}$$

$$\frac{\lim_{x\to 2}(2-f(x))}{\lim_{x\to 2}(3+g(x))} = \frac{\lim_{x\to 2} 2 - \lim_{x\to 2} f(x)}{\lim_{x\to 2} 3 - \lim_{x\to 2} gx} = \frac{2-4}{3-1} = -\frac{1}{2}$$

Theorem 3

1. $\lim_{x \to c} f(x) = f(c)$ for any polynomial function

2. $\lim_{x \to c} r(x) = r(c)$ for any rational function with a non zero denominator at $x = c$

$$\lim_{x \to 2} (x^4 - x^2 + 1) = 2^4 - 2^2 + 1 = 13$$

$$\lim_{x \to 2} \sqrt[2]{x-1} = \sqrt[2]{\lim_{x \to 2}(x-1)} = \sqrt[2]{2-1} = 1$$