Suppose $c \in \mathcal{R}$ and suppose $lim_{x\to a}f(x)$ and $lim_{x\to a}g(x)$ exist.
Then

$$lim_{x\to a}[f(x)+g(x)] = lim_{x\to a}f(x) + lim_{x\to a}g(x)$$

$$lim_{x\to a}[cf(x)] = c\ lim_{x\to a}f(x)$$

$$lim_{x\to a}[f(x)g(x)] = lim_{x\to a}f(x)\ lim_{x\to a}g(x)$$

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

Defn: f is continuous at a
iff $lim_{x\to a}f(x) = f(lim_{x\to a}x) =$

If f is continuous implies

$$lim_{x\to a}f(g(x)) = f(lim_{x\to a}g(x))$$

Ex: $lim_{x\to 9}e^{\sqrt{x}} - 2\sqrt{x} + 4$

$$lim_{x\to 3}\frac{x^2-1}{x+3}$$

$$lim_{x\to 3}\frac{x^2-1}{x-3}$$

$$lim_{x\to 3}\frac{(x^2-1)(x-3)}{x-3}$$

$$lim_{x\to 3}\frac{x-3}{x^2-1}$$

$$lim_{x\to 3}\frac{(x-4)^2}{x^5(x-8)^9(x-3)^3}$$

$$lim_{x\to 3}\frac{(x-4)^2(x-3)}{x^5(x-8)^9(x-3)^3}$$

Suppose $f(x) = \sqrt{x}$. Find $lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$ where $x > 0$