Computing Limits

Limits of Basic Functions

- For most functions $\lim_{x \to a} f(x) = f(a)$
- Examples:
  - $\lim_{x \to 5} 2x - 7 = 3$
  - $\lim_{x \to 0} \sin^{-1}(e^x) = \sin^{-1}(e^0) = \sin^{-1}(1) = \pi/2$

Rules of Limits

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

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

$$\lim_{x \to a} \left(c\, f(x) \right) = c \lim_{x \to a} f(x)$$

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

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

$$\lim_{x \to a} \left(f(x) \right)^n = \left(\lim_{x \to a} f(x) \right)^n$$

Squeeze Theorem

- If we have f(x) ≤ g(x) ≤ h(x), then if:

$$\lim_{x \to a} f(x) = \lim_{x \to a} h(x) = L \text{ then } \lim_{x \to a} g(x) = L$$

- Basiclly if g is between f and h then as f and h approach a, g approches the same thing

Questions?