Recitation 3

Wednesday 12th November, 2014

Contents

1 Sandwich Theorem

1.1 Examples

1.1.1 $\lim_{x\to\infty} \frac{5x^2 - \sin(3x)}{x^2 + 10}$

$$\frac{5x^2 - 1}{x^2 + 10} \leq \frac{5x^2 - \sin(3x)}{x^2 + 10} \leq \frac{5x^2 + 1}{x^2 + 10}$$

$$\therefore \frac{5 - \frac{1}{x^2}}{1 + \frac{10}{x^2}} \leq \frac{5x^2 - \sin(3x)}{x^2 + 10} \leq \frac{5 + \frac{1}{x^2}}{1 + \frac{10}{x^2}}$$

$$\therefore \lim_{x\to\infty} \frac{5x^2 - \sin(3x)}{x^2 + 10} = 5$$

2 Intermediate Value Theorem

If f is continuous over $[a, b]$, then, $\forall h$ between $f(a)$ and $f(b), \exists c \in [a, b]$, s.t. $f(c) = h$

3 Weierstrauss Theorem

If f is continuous over $[a, b]$, then, f has a maximum and a minimum in $[a, b]$.