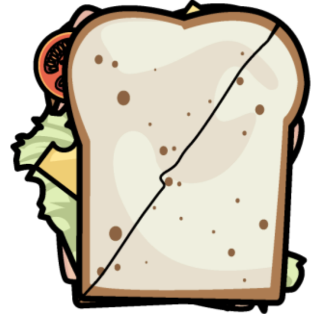
SQUEEZE



Theorem

NOTE: (also called the Sandwich Theorem OR Pinching Theorem)

If $f(x) \le g(x) \le h(x)$ when x is near a (except possibly at a

& $\lim_{x\to a} f(x) = \lim_{x\to a} h(x) = L$,

then $\lim_{x\to a} g(x) = L$.

Examples: **1.** Show that, $\lim_{x\to 0} x^2 \sin\frac{1}{x} = 0$

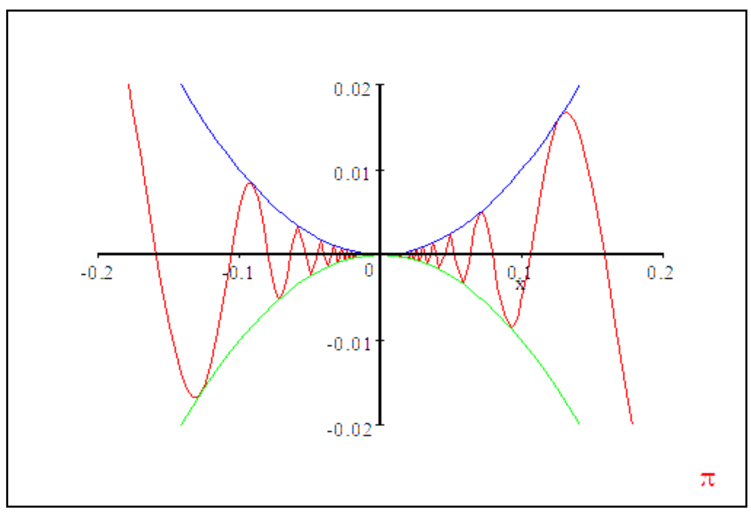
Can't use $\lim_{x\to 0} x^2 \sin\frac{1}{x} = 0$ because the $\sin\frac{1}{x}$ does not exist as x→0.

We know $-1 \le \sin\frac{1}{x} \le 1$

So, $-x^2 \le x^2 \sin\frac{1}{x} \le x^2$

$\lim_{x\to 0}(-x^2) = 0$ $\lim_{x\to 0} x^2 = 0$

$\therefore \lim_{x\to 0} x^2 \sin\frac{1}{x} = 0$



Apply the Squeeze Theorem to the following to determine the limit.

2. If $2x + 2 \le f(x) \le x^2 + 3$ for all values of $0 \le x \le 2$

then $\lim_{x\to 1} f(x) =$

3. If $-x^2 - 2 \le g(x) \le 2x - 1$ for $-2 \le x \le 0$

then $\lim_{x\to -1} g(x) =$