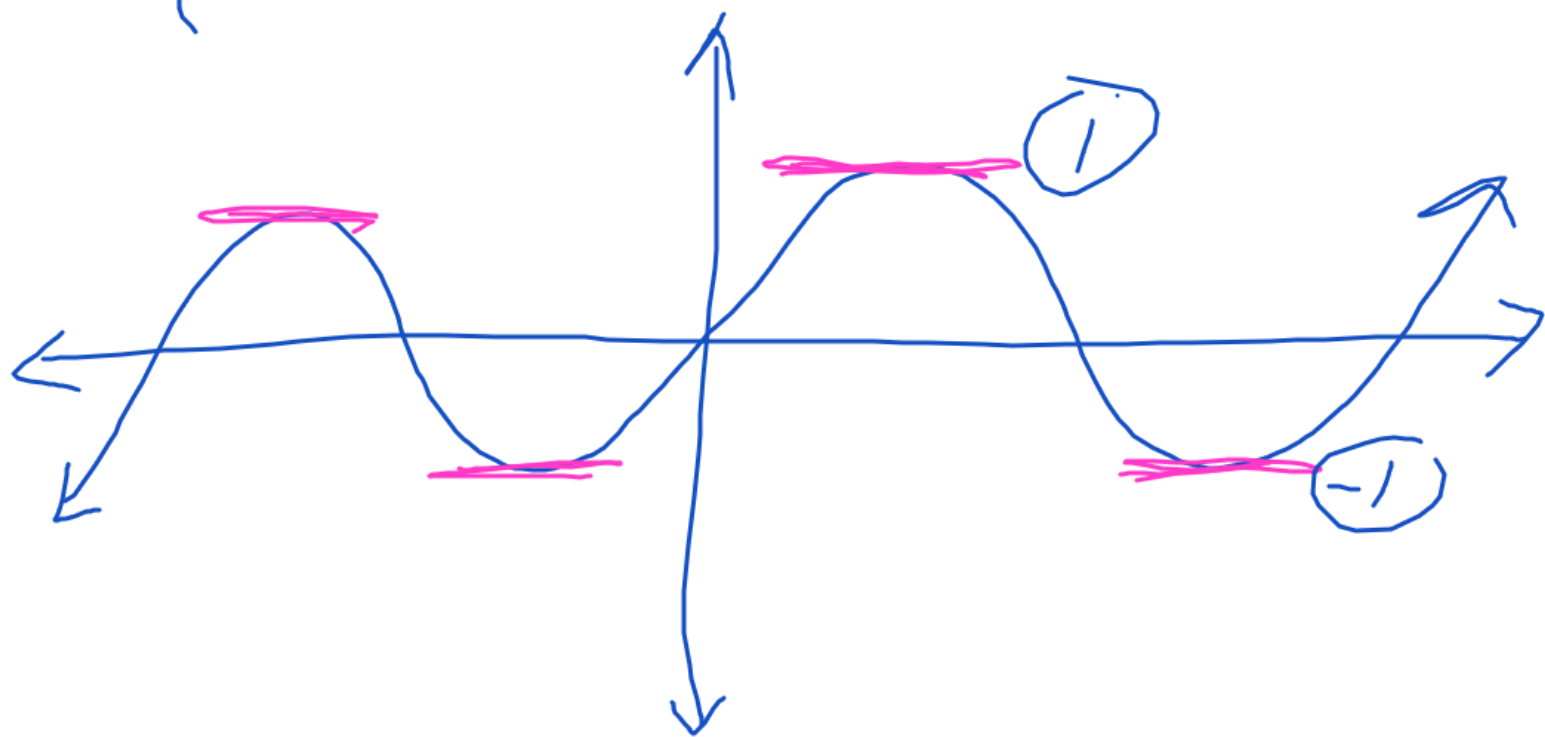


$$\lim_{x \rightarrow 0} 4x \sin\left(\frac{1}{x^2}\right)$$



$$\lim_{x \rightarrow 0} 4x \sin\left(\frac{1}{x^2}\right) = 0$$

$$\rightarrow -1 \leq \sin(\star) \leq 1$$

by the
Squeeze Thm.

$$\rightarrow (-1 \leq \sin\left(\frac{1}{x^2}\right) \leq 1) \cdot 4x$$

$$(-4x \leq 4x \sin\left(\frac{1}{x^2}\right) \leq 4x) \quad \lim_{x \rightarrow 0}$$

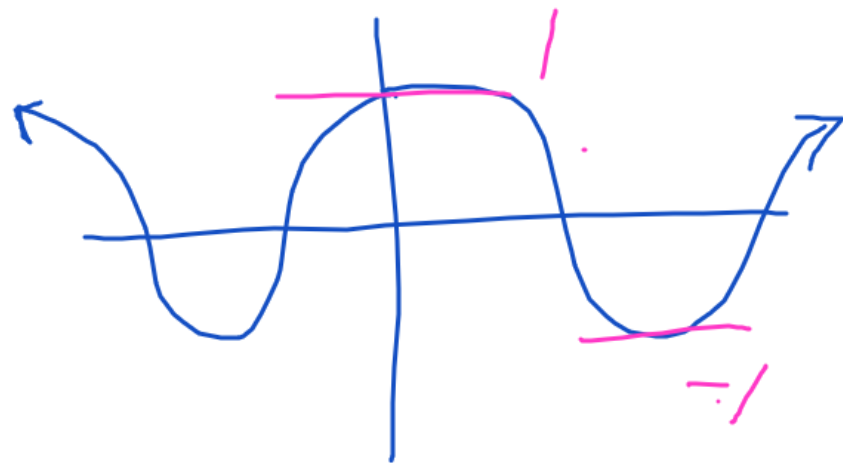
$$\lim_{x \rightarrow 0} -4x \leq \lim_{x \rightarrow 0} 4x \sin\left(\frac{1}{x^2}\right) \leq \lim_{x \rightarrow 0} 4x$$
$$\lim_{x \rightarrow 0} 4x \sin\left(\frac{1}{x^2}\right) = 0$$

$$-1 \leq \heartsuit \leq 1$$

$$0.5$$
$$\boxed{-1 \leq 0.5 \leq 1}$$

#0

$$\lim_{x \rightarrow 0} x^2 \cos\left(\frac{4}{x}\right)$$



$$\left(-1 \leq \cos\left(\frac{4}{x}\right) \leq 1\right)$$

$$\left(e^{-1} \leq e^{\cos\left(\frac{4}{x}\right)} \leq e^1\right) \cdot x^2$$

$$\left(x^2 e^{-1} \leq x^2 \cos\left(\frac{4}{x}\right) \leq x^2 e\right)$$

$$\boxed{\lim_{x \rightarrow 0} \frac{x^2}{e}}$$

$$\leq \lim_{x \rightarrow 0} x^2 \cos\left(\frac{4}{x}\right)$$

$$\leq \boxed{\lim_{x \rightarrow 0} x^2 e}$$

$0 \leq \heartsuit \leq 0$

$\rightarrow \boxed{0}$

~~by the~~
Squeeze Thm.

HW 3 #13

$$\lim_{x \rightarrow -5} \frac{-8|x| + 40}{2x + 10} = 4$$



$x \geq 0$

$$\lim_{x \rightarrow -5} \frac{-8x + 40}{2x + 10}$$

$$\lim_{x \rightarrow -5} \frac{-8(x-5)}{2(x+5)}$$

$x < 0$

$$\lim_{x \rightarrow -5} \frac{8x + 40}{2x + 10}$$

$$\lim_{x \rightarrow -5} \frac{8(x+5)}{2(x+5)} = 4$$

$$\lim_{x \rightarrow -2} \frac{x^2 - 4}{|x + 2|} = \text{DNE}$$



$$\lim_{x \rightarrow -2} \frac{x^2 - 4}{x + 2} \rightarrow \lim_{x \rightarrow -2} \frac{\cancel{(x+2)}(x-2)}{\cancel{x+2}}$$

$$\lim_{x \rightarrow -2^+} (x - 2) = -4$$



$$\lim_{x \rightarrow -2} \frac{x^2 - 4}{-(x + 2)} \rightarrow \lim_{x \rightarrow -2} \frac{\cancel{(x+2)}(x-2)}{-\cancel{(x+2)}}$$

$$\lim_{x \rightarrow -2^-} -(x - 2) = 4$$