

Question #76447, Math / Calculus

Prove that

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

Solution

$$\lim_{x \rightarrow 0} x * \sin\left(\frac{2}{x}\right) \Leftrightarrow \lim_{x \rightarrow 0} x * \lim_{x \rightarrow 0} \sin\left(\frac{2}{x}\right)$$

$$\text{For } -1 \leq x \leq 1, \quad -1 \leq \sin\left(\frac{2}{x}\right) \leq 1$$

$$\text{Also, } \lim_{x \rightarrow 0} x = 0. \text{ Therefore } \lim_{x \rightarrow 0} x * \sin\left(\frac{2}{x}\right) = 0$$

Answer provided by <https://www.AssignmentExpert.com>