$$\lim_{x \to 0} 2\sin(2x) = 0 \qquad |x| < \delta , \qquad |2\sin(2x)| < \varepsilon$$

$$|\sin(2x)| < \frac{\varepsilon}{2}$$

* for any $\varepsilon > 0$, there are $\delta > 0$ such that $|x| < \delta$

$$|\sin(2x)| < 2|x| < \frac{\varepsilon}{2}$$

$$|\sin(2x)| < |x| < \frac{\varepsilon}{4}$$

* For every $\varepsilon > 0$, $\delta = \frac{\varepsilon}{4}$ then $|x| < \delta$ proves

$$|2\sin(2x)| < \varepsilon$$