[17] Найти пределы функции:

$$\lim_{x\to 0} \frac{\sin 5x}{\sin 3x} = (1)$$

$$\lim_{x\to 0} \sin 5x = (\sin 5x)_{x=0} = \sin 5\cdot 0 = \sin 0 = 0$$

$$\lim_{x\to 0} \sin 3x = (\sin 3x)_{x=0} = \sin 3\cdot 0 = \sin 0 = 0$$

$$(1) = \left(\frac{0}{0}\right)$$

$$\frac{\sin 5x}{\sin 3x} = \{x\neq 0\} = \frac{\sin 5x}{x}\,\frac{x}{\sin 3x} =$$

$$= 5\,\frac{\sin 5x}{5x}\,\frac{1}{3}\,\frac{3x}{\sin 3x} = \frac{5}{3}\,\frac{\sin 5x}{5x}\left(\frac{\sin 3x}{3x}\right)^{-1}$$

$$(1) = \lim_{x\to 0} \frac{5}{3}\,\frac{\sin 5x}{5x}\left(\frac{\sin 3x}{3x}\right)^{-1} =$$

$$= \frac{5}{3}\lim_{x\to 0}\frac{\sin 5x}{5x}\left(\lim_{x\to 0}\frac{\sin 3x}{3x}\right)^{-1} = (2)$$

$y = ax$, $a>0$

$$\lim_{x\to 0} y = \lim_{x\to 0} ax = (ax)_{x=0} = a\cdot 0 = 0$$

$$\lim_{x\to 0} \frac{\sin 5x}{5x} = \{y = 5x\} = \lim_{y\to 0} \frac{\sin y}{y} = 1$$

$$\lim_{x\to 0} \frac{\sin 3x}{3x} = \{y = 3x\} = \lim_{y\to 0} \frac{\sin y}{y} = 1$$

$$(2) = \frac{5}{3}\cdot 1\cdot 1^{-1} = \frac{5}{3}$$

Ответ:

$$\boxed{\lim_{x\to 0} \frac{\sin 5x}{\sin 3x} = \frac{5}{3}}$$