

[3] Найдите предел функции:

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{2x^2 - x - 1} = (1)$$

$$(x^2 - 1)_{x=1} = 1^2 - 1 = 1 - 1 = 0$$

$$(2x^2 - x - 1)_{x=1} = 2 \cdot 1^2 - 1 - 1 = 2 - 1 - 1 = 0$$

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

$$x^2 - 1 = (x - 1)(x + 1)$$

$$2x^2 - x - 1 = 2x^2 - 2x + x - 1 = 2x(x - 1) + (x - 1) = (2x + 1)(x - 1)$$

$$\frac{x^2 - 1}{2x^2 - x - 1} = \frac{(x - 1)(x + 1)}{(2x + 1)(x - 1)} = \{ x - 1 \neq 0 ; x \neq 1 \} =$$

$$= \frac{x + 1}{2x + 1}$$

$$(1) = \lim_{x \rightarrow 1} \frac{x + 1}{2x + 1} = \left( \frac{x + 1}{2x + 1} \right)_{x=1} =$$

$$= \frac{1 + 1}{2 \cdot 1 + 1} = \frac{1 + 1}{2 + 1} = \frac{2}{3}$$

Ответ:

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{2x^2 - x - 1} = \frac{2}{3}$$