1 Найти предел функции:

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

$$\lim_{x\to\infty} x^2-1 = \infty$$

$$\lim_{x\to\infty} 2x^2-x-1 = \infty$$

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

$$x^2-1 = \{x\neq 0\} = x^2\left(1-\frac{1}{x^2}\right)$$

$$2x^2-x-1 = \{x\neq 0\} = x^2\left(2-\frac{x}{x^2}-\frac{1}{x^2}\right) = x^2\left(2-\frac{1}{x}-\frac{1}{x^2}\right)$$

$$\frac{x^2-1}{2x^2-x-1} = \{x\neq 0\} = \frac{x^2\left(1-\frac{1}{x^2}\right)}{x^2\left(2-\frac{1}{x}-\frac{1}{x^2}\right)} = \frac{1-\frac{1}{x^2}}{2-\frac{1}{x}-\frac{1}{x^2}}$$

$$(1) = \lim_{x\to\infty} \frac{1-\frac{1}{x^2}}{2-\frac{1}{x}-\frac{1}{x^2}} = \frac{1-\lim\limits_{x\to\infty}\frac{1}{x^2}}{2-\lim\limits_{x\to\infty}\frac{1}{x}-\lim\limits_{x\to\infty}\frac{1}{x^2}} =$$

$$= \frac{1-0}{2-0-0} = \frac{1+0}{2+0} = \frac{1}{2}$$

Ответ:

$$\boxed{\lim_{x\to\infty} \frac{x^2-1}{2x^2-x-1} = \frac{1}{2}}$$