

Exercise 43

Find the limit, if it exists. If the limit does not exist, explain why.

$$\lim_{x \rightarrow 0.5^-} \frac{2x - 1}{|2x^3 - x^2|}$$

Solution

Note that $2(0.499)^3 - (0.499)^2 \approx -0.000498$.

$$\lim_{x \rightarrow 0.5^-} \frac{2x - 1}{|2x^3 - x^2|} = \lim_{x \rightarrow 0.5^-} \frac{2x - 1}{-(2x^3 - x^2)} = \lim_{x \rightarrow 0.5^-} \frac{2x - 1}{-x^2(2x - 1)} = \lim_{x \rightarrow 0.5^-} \frac{1}{-x^2} = \frac{1}{-0.5^2} = -4$$

The graph below of the function versus x confirms this result.

