

29 $\lim_{x \rightarrow 1} \frac{\sqrt[3]{2x^2-1} - \sqrt{x}}{x-1}$

$a^3 - b^3 = (a-b)(a^2 + ab + b^2) = (a-b)(a^2 + ab + b^2)$

$$\lim_{x \rightarrow 1} \frac{\sqrt[3]{2x^2-1} - \sqrt{x}}{x-1} \cdot \frac{\sqrt[3]{(2x^2-1)^2} + \sqrt[3]{2x^2-1} \sqrt{x} + \sqrt{x}}{\sqrt[3]{(2x^2-1)^2} + \sqrt[3]{2x^2-1} \sqrt{x} + \sqrt{x}} \cdot \frac{2x^2-1 + \sqrt{x^3}}{2x^2-1 + \sqrt{x^3}} = \lim_{x \rightarrow 1} \frac{(2x^2-1)^2 - x^3}{(x-1)(x+1)(x+1)} =$$

$$\lim_{x \rightarrow 1} \frac{4x^4 - 4x^2 - x^3}{6(x-1)} = \lim_{x \rightarrow 1} \frac{4x^2(x^2-1) - (x^3)}{6(x-1)} = \lim_{x \rightarrow 1} \frac{4x^2(x-1)(x+1) - (x^3)}{6(x-1)} = \lim_{x \rightarrow 1} \frac{(x-1)(4x^2(x+1) - x^2 - x - 1)}{6(x-1)} =$$

$$= \frac{4 \cdot 2 - 1 - 1 - 1}{6} = \frac{5}{6}$$