

Answer on Question #47289 – Math – Calculus

$y=x \cdot (\text{whole underroot of } 2x^2 - 1)$ differentiate it w.r.t x

Solution:

$$y = x\sqrt{2x^2 - 1}$$

Derivative product rule:

$$(fg)' = f'g + fg'$$

In our case:

$$\begin{aligned} f &= x; g = \sqrt{2x^2 - 1} \\ y' &= (fg)' = \left(x\sqrt{2x^2 - 1}\right)' = x'\sqrt{2x^2 - 1} + x(\sqrt{2x^2 - 1})' = \\ &= 1 \cdot \sqrt{2x^2 - 1} + x \cdot \frac{1}{2\sqrt{2x^2 - 1}} \cdot (2x^2 - 1)' = \\ &= \sqrt{2x^2 - 1} + \frac{x \cdot 4x}{2\sqrt{2x^2 - 1}} = \frac{2x^2 - 1 + 2x^2}{\sqrt{2x^2 - 1}} = \frac{4x^2 - 1}{\sqrt{2x^2 - 1}} \end{aligned}$$

Answer: $y' = \frac{4x^2 - 1}{\sqrt{2x^2 - 1}}$