

Answer on Question #47296 – Math – Other

Question:

$y = 2x^2 - 3x + \frac{1}{\sqrt{x-3}}$  differentiate it w.r.t x.

Answer:

$$y = 2x^2 - 3x + \frac{1}{\sqrt{x-3}}$$

Derivative:

$$\frac{d}{dx} \left( 2x^2 - 3x + \frac{1}{\sqrt{x-3}} \right) = 4x - \frac{1}{2(x-3)^{3/2}} - 3$$

$$\begin{aligned} \frac{d}{dx} f(x) &= \frac{d}{dx} \left( 2x^2 - 3x + \frac{1}{\sqrt{x-3}} \right) \\ &= 2 \cdot \frac{d}{dx} (x^2) + \frac{d}{dx} \left( \frac{1}{\sqrt{x-3}} \right) - 3 \\ &= \frac{-\frac{d}{dx} (\sqrt{x-3})}{x-3} + 2 \cdot 2x - 3 \\ &= 4x - \frac{\frac{1}{2 \cdot \sqrt{x-3}} \cdot \frac{d}{dx} (x-3)}{x-3} - 3 \\ &= 4x - \frac{1}{2 \cdot (x-3)^{\frac{3}{2}}} - 3 \end{aligned}$$

Answer:

$$\frac{d}{dx} \left( 2x^2 - 3x + \frac{1}{\sqrt{x-3}} \right) = 4x - \frac{1}{2(x-3)^{3/2}} - 3$$