

Answer on Question #48348 – Math – Calculus

Evaluate the derivative $\frac{d}{dx}\sqrt{3x^3}\ln(3x - e^{x^2})$

Solution:

Use the derivative for product of functions:

$$\begin{aligned} & \frac{d}{dx}(\sqrt{3x^3}\ln(3x - e^{x^2})) = \\ & = \ln(3x - e^{x^2})\frac{d}{dx}(\sqrt{3x^3}) + \sqrt{3x^3}\frac{d}{dx}(\ln(3x - e^{x^2})) = \\ & = \frac{\sqrt{3} \cdot 3x^2 \ln(3x - e^{x^2})}{2\sqrt{x^3}} + \frac{\sqrt{3x^3}(3 - 2xe^{x^2})}{3x - e^{x^2}} = \\ & = \frac{\sqrt{3}x^2(3\ln(3x - e^{x^2}) + \frac{2x(3 - 2xe^{x^2})}{3x - e^{x^2}})}{2\sqrt{x^3}} \end{aligned}$$

Answer:

$$\frac{d}{dx}\sqrt{3x^3}\ln(3x - e^{x^2}) = \frac{\sqrt{3}x^2(3\ln(3x - e^{x^2}) + \frac{2x(3 - 2xe^{x^2})}{3x - e^{x^2}})}{2\sqrt{x^3}}$$