

Answer on Question #61377 – Math – Calculus

Question

9 Differentiate with respect to x : $f(x) = (ax^3 + bx)$

3a-b

ax^2+b

$3x^2+1$

$3ax^2+b$

Solution

$$\frac{df}{dx} = \frac{d}{dx}(ax^3 + bx) = \frac{d}{dx}(ax^3) + \frac{d}{dx}(bx) = a \frac{d}{dx}(x^3) + b \frac{d}{dx}(x) = 3ax^2 + b.$$

Answer: $3ax^2 + b$.

Question

10 Differentiate $y = \sqrt[3]{x^2}(2x - x^2)$ with respect to x

$y=10x^{2/3}-8x^{5/3}$

$y=10x^{2/3}+8x^{5/3}$

$y=5x^{2/3}-4x^{5/3}$

$y=5x^{2/3}+4x^{5/3}$

Solution

$$y = \sqrt[3]{x^2}(2x - x^2) = x^{2/3}(2x - x^2) = 2x^{5/3} - x^{8/3}$$

$$\frac{dy}{dx} = \frac{d}{dx}\left(2x^{5/3} - x^{8/3}\right) = 2 \frac{d}{dx}\left(x^{5/3}\right) - \frac{d}{dx}\left(x^{8/3}\right) = 2\left(\frac{5}{3}\right)x^{2/3} - \frac{8}{3}x^{5/3} = \frac{10}{3}x^{2/3} - \frac{8}{3}x^{5/3}.$$

Answer : $\frac{10}{3}x^{2/3} - \frac{8}{3}x^{5/3}$.