Answer on Question #47076 – Math – Differential Calculus | Equations

Question:

Differentiate with respect to x, if y =4x^3.sinx

a. 4x^2(xcosx+sinx)

b. 4x^2(cosx+3sinx)

c. 4x^2(xcosx+3sinx)

d. 4x^2(xcosx−3sinx)

Solution:

The product rule: For the functions f and g, the derivative of the function

$h(x) = f(x)g(x)$ with respect to x is the following:

$$h'(x) = f(x)g'(x) + f'(x)g(x)$$

Therefore:

$$y' = 4x^3(\sin x)' + (4x^3)' \sin x = 4x^3 \cos x + 4 \cdot 3x^2 \sin x$$
$$= 4x^2(x \cos x + 3 \sin x)$$

Answer: c. $4x^2(x \cos x + 3 \sin x)$