Derivatives of Products and Quotients

… Set 3

Exercises

Find the derivative of each of the following:

a) $x \tan x$ b) $x^2 e^{-x}$

c) $5e^{-2x} \sin 3x$ d) $3x^{1/2} \cos 2x$

e) $2x^6(1+x)^5$ f) $x^{-2}(1+x^2)^{1/2}$

g) $xe^x \sin x$ h) $7x^{3/2}e^{-4x} \cos 2x$

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Answers

a) $x\sec^2 x + \tan x$

b) $x(2-x)\mathrm{e}^{-x}$

c) $5\mathrm{e}^{-2x}(3\cos 3x - 2\sin 3x)$

d) $\frac{3}{2}x^{-1/2}(\cos 2x - 4x\sin 2x)$

e) $2x^5(1+x)^4(6+11x)$

f) $-x^{-3}((1+x^2)^{-1/2}(2+x^2)$

g) $\mathrm{e}^x[(1+x)\sin x + \cos x]$

h) $\frac{7}{2}x^{1/2}\mathrm{e}^{-4x}(3\cos 2x - 8x\cos 2x - 4x\sin x)$