



Air maths tuition

Interact, engage and perform

How to differentiate composite Exponential Functions

<p>Differentiate the following:</p> $y = 3e^{x^2}$ <p>let $t = x^2$</p> $\therefore y = 3e^t$ $\therefore \frac{dy}{dx} = (3e^{x^2})(2x)$ $= 6xe^{x^2}$	$\frac{dy}{dx} = \frac{dy}{dt} \frac{dt}{dx}$ $y = ae^t$ $\frac{dy}{dt} = ae^t$	$y = \frac{5}{e^{2x}} = 5e^{-2x}$ $\therefore \frac{dy}{dx} = (5e^{-2x})(-2)$ $= -10e^{-2x} = -\frac{10}{e^{2x}}$
$y = -5e^{3x+2}$ $\therefore \frac{dy}{dx} = (-5e^{3x+2})(3)$ $= -15e^{3x+2}$		$y = \frac{4}{3e^{5x-2}} = \frac{4}{3}e^{-5x+2}$ $\therefore \frac{dy}{dx} = \left(\frac{4}{3}e^{-5x+2}\right)(-5)$ $= -\frac{20}{3}e^{-5x+2}$

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