

9/13/06

$$y = (3t^{5/2} + 5)e^t \quad \text{find } y'$$

$$y = 3e^t t^{5/2} + 5e^t$$

Here we re-arrange the function

$$\left[\text{Product rule: } \frac{d}{dx}(f(x)g(x)) = f'(x)g(x) + g'(x)f(x) \right]$$

$$y' = 3 \left(\frac{d}{dt}(e^t) t^{5/2} + e^t \frac{d}{dt}(t^{5/2}) \right) + 5 \frac{d}{dt}(e^t) \quad \text{Here we apply the product rule.}$$

$$y' = 3(e^t t^{5/2} + e^t \cdot \frac{5}{2} t^{3/2}) + 5e^t$$

Here we find the derivatives of the component functions of y

$$y' = 3e^t t^{5/2} + \frac{15}{2} e^t t^{3/2} + 5e^t$$

Here we simplify

$$y' = \frac{1}{2} e^t (15t^{3/2} + 6t^{5/2} + 10) \quad \text{Here we "simplify!"}$$

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