

Sum Rule for Differentiation: $(af + bg)' = af' + bg'$

$$\frac{d}{dy} (5y^2 + 2y^6)$$

$$\frac{d}{dx} (3x^2 + 2x - 5)$$

$$\frac{d}{dt} (4e^{2t} + 7\ln(t))$$

$$\pi(q) = 5q^{3/2} + 6q^{-1/2}$$

$$\frac{d}{dt} (\ln(3t^5))$$

Sum Rule for Differentiation: $(af + bg)' = af' + bg'$

$$\frac{d}{dy} (\underbrace{5y^2}_{f(y)=y^2} + \underbrace{2y^6}_{g(y)=y^6}) = \frac{d}{dy} (5f'(y) + 2g'(y)) = 5f'(y) + 2g'(y) = 5(2y) + 2(6y^5) = \underline{\underline{10y + 12y^5}}$$

$$\frac{d}{dx} (\underline{3x^2} + \underline{2x} - \underline{5}) = 3 \frac{d}{dx} (x^2) + 2 \frac{d}{dx} (x) + \frac{d}{dx} (-5) = 3(2x) + 2 \cdot 1 + 0 = \underline{\underline{6x + 2}}$$

$$\frac{d}{dt} (4e^{2t} + 7 \ln(t)) = 4(2e^{2t}) + 7 \frac{1}{t} = \underline{\underline{8e^{2t} + \frac{7}{t}}}$$

$$\pi(q) = 5q^{3/2} + 6q^{-1/2}, \quad \pi'(q) = 5 \left(\frac{3}{2} q^{1/2} \right) + 6 \left(-\frac{1}{2} q^{-3/2} \right) = \frac{15}{2} q^{1/2} - 3q^{-3/2}$$

$$\frac{d}{dt} (\ln(3t^5)) = \frac{d}{dt} (\ln(3) + 5 \ln(t)) = 0 + 5 \left(\frac{1}{t} \right) = \underline{\underline{\frac{5}{t}}}$$

$$\ln(ab) = \ln(a) + \ln(b)$$

$$\ln(a^n) = n \ln(a)$$

$$\ln(3t^5) = \ln(3) + \ln(t^5) = \ln(3) + 5 \ln(t)$$