

- Sec 11.1 :-

[8] Find the derivatives:-

$$y = \ln(6x+1)$$

$$\rightarrow y' = \frac{6}{6x+1}$$

[12] Find $\frac{ds}{dq}$ if $S = \ln\left(\frac{q^2}{4} + 1\right)$

$$\rightarrow \frac{ds}{dq} = \frac{\frac{2q}{4}}{\frac{q^2}{4} + 1} = \frac{\frac{2q}{4}}{\frac{q^2}{4} + \frac{1 \cdot 4}{4}} = \frac{\frac{2q}{4}}{\frac{q^2+4}{4}} = \frac{2q}{q^2+4}$$

[18] a) $y = 3\ln x - \ln(x+1)$

$$\rightarrow y' = 3 \cdot \frac{1}{x} - \frac{1}{x+1}$$

$$= \frac{3}{x} - \frac{1}{x+1} = \frac{3(x+1) - x}{x(x+1)} = \frac{2x+3}{x(x+1)}$$

~~10.21~~

[22] Find $\frac{dy}{dx}$ if $y = \ln\left(\frac{3x+2}{x^2-5}\right)^{\frac{1}{4}}$

$$\rightarrow y = \frac{1}{4} \ln\left(\frac{3x+2}{x^2-5}\right)$$

$$= \frac{1}{4} [\ln(3x+2) - \ln(x^2-5)]$$

$$\therefore y' = \frac{1}{4} \left[\frac{3}{3x+2} - \frac{2x}{x^2-5} \right]$$