Diffrentiation = अवकलन

08. Chain rule

$$\mathbf{y = (x^2 + 2)^5}$$

$$\frac{\mathbf{d}}{\mathbf{dx}}\mathbf{(x^2 + 2)^5} = \mathbf{5(x^2 + 5)^{5-1} = 5(x^2 + 2)^4}$$

$$= \frac{\boldsymbol{d}}{\boldsymbol{dx}}\boldsymbol{(x^2 + 2) = 2x^{2-1} + 0 = 2x + 0 = 2x}$$

$$\boldsymbol{= 2x.\,5(x^2 + 5) = 10x(x^2 + 5)\ Ans}$$

$$\mathbf{y} = \frac{2x}{4x+3}$$

$$\frac{\mathbf{d}}{\mathbf{dx}}\left(\frac{2x}{4x+3}\right) = \frac{(4x+3)\frac{d}{dx}(2x) - (2x)\frac{d}{dx}(4x+3)}{(4x+3)^2}$$

$$= \frac{(4x+3)2\frac{d}{dx}(x) - (2x)\left[\frac{d}{dx}(4x) + \frac{d}{dx}(3)\right]}{(4x+3)^2}$$

$$= \frac{2(4x+3) - 2x[4(1)+(0)]}{(4x+3)^2}$$

$$= \frac{8x+6-8x}{(4x+3)^2} = \frac{6}{(4x+3)^2}\ \boldsymbol{Ans}$$