Class:- 11th (Topic :- Differentiation)

Q.17 find $\frac{dy}{dx}$ if $y = \frac{10^x}{\sin x}$

Sol:- $y = \frac{10^x}{\sin x}$

Diff. w.r.t. 'x' both the side

$$\frac{dy}{dx} = \frac{\sin x \frac{d}{dx} 10^x - 10^x \frac{d}{dx} \sin x}{(\sin x)^2}$$

$$\frac{dy}{dx} = \frac{\sin x \times 10^x \log 10 - 10^x \cos x}{\sin^2 x}$$

$$\frac{dy}{dx} = \frac{\sin x}{\sin^2 x} \times 10^x \log 10 - 10^x \frac{\cos x}{\sin^2 x}$$

$$\frac{dy}{dx} = 10^x \log 10 \cdot \operatorname{cosec} x - 10^x \cdot \cot x \cdot \operatorname{cosec} x$$

Class:- 11th (Topic :- Differentiation)

Ex 30.5

Q. 29. $y = \frac{ax+b}{px^2+qx+r}$

Diff. w.r.t. 'x' both the side

$$\frac{dy}{dx} = \frac{(px^2+qx+r)\frac{d}{dx}(ax+b) - (ax+b)\frac{d}{dx}(px^2+qx+r)}{(px^2+qx+r)^2}$$

$$\frac{dy}{dx} = \frac{(px^2+qx+r)\times(a\times1+0) - (ax+b)\times(2px+q\times1+0)}{(px^2+qx+r)^2}$$

$$= \frac{apx^2+aqx+0r-2apx^2-aqx-2bpx-bq}{(px^2+qx+r)^2}$$

$$\boxed{\frac{dy}{dx} = \frac{-apx^2-2bpx+qr-bq}{(px^2+qx+r)^2}}$$