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Class-XII (MATHS)

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Integrate  $\rightarrow$ 

$$1) \int \frac{e^{\tan^{-1}x}}{1+x^2} dx$$

$$\text{let } \tan^{-1}x = t \quad \therefore \frac{dt}{dx} = \frac{1}{1+x^2}$$

$$\therefore dt = \frac{dx}{1+x^2}$$

$$\Rightarrow \int e^t dt$$

$$\Rightarrow e^t + C \Rightarrow e^{\tan^{-1}x} + C.$$

$$2) \int \frac{e^{2x} - e^{-2x}}{e^{2x} + e^{-2x}} dx$$

$$\text{let } e^{2x} + e^{-2x} = t$$

differentiating w.r.t x

$$2e^{2x} - 2e^{-2x} = \frac{dt}{dx}$$

$$dt = 2(e^{2x} - e^{-2x}) dx$$

$$\frac{dt}{2} = (e^{2x} - e^{-2x}) dx$$

$$\Rightarrow \frac{dt}{2} = e^{2x} - e^{-2x} dx$$

$$\therefore \int \frac{t}{2t} \Rightarrow \int \frac{1}{2} dt$$

$$\frac{1}{2} \int \frac{1}{t} dt = \frac{1}{2} \log t + C$$

$$\Rightarrow \frac{1}{2} \log (e^{2x} + e^{-2x}) + C$$

$$(3) \int \tan^2(2x-3) dx$$

~~let~~

$$\int [\sec^2(2x-3) - 1] dx$$

$$\int \sec^2(2x-3) dx - \int dx$$

$$\frac{\tan(2x-3)}{2} - x + C.$$

$$4) \int \sec^2(7-4u) du$$

$$\frac{\tan(7-4u)}{-4} + C$$

Solve Ex - 7.2