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Class-XII^{sc} (MATHS)

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Topic :- Integrate :-

$$1) \int \frac{2 \cos x - 3 \sin x}{6 \cos x + 4 \sin x} dx$$

$$\text{Let } 6 \cos x + 4 \sin x = t$$

$$\therefore \frac{dt}{dx} = -6 \sin x + 4 \cos x$$

$$\frac{dt}{dx} = 2(2 \cos x - 3 \sin x)$$

$$\frac{dt}{2} = (2 \cos x - 3 \sin x) dx$$

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

$$\Rightarrow \frac{1}{2} \log |6 \cos x + 4 \sin x| + C$$

$$2) \int \frac{\sin x}{1 + \cos x} dx$$

$$\text{Let } 1 + \cos x = t$$

$$\therefore \frac{dt}{dx} = -\sin x$$

$$- dt = \sin x dx$$

$$-\int \frac{dt}{t} = -\log t + c$$

$$\Rightarrow -\log |1 + \cos x| + c.$$

(3)

$$\int \frac{\sin x}{(1 + \cos x)^2} dx$$

$$\text{Let } 1 + \cos x = t \quad \therefore \frac{dt}{dx} = -\sin x$$

$$-dt = \sin x dx$$

$$-\int \frac{dt}{t^2} = -\int t^{-2} dt$$

$$\Rightarrow -\left[\frac{t^{-2+1}}{-2+1} \right] + c$$

$$= \left[\frac{1}{t} \right] + c$$

$$\frac{1}{1 + \cos x} + c$$

Solve Ex- 7-2