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Serial No: 187

atric No: 19 (MHSOT/262)

$$1) \int \frac{2x \cdot dx}{\sqrt{4x^2-1}}$$

Solution

$$\text{let } u = \sqrt{4x^2-1}$$

$$u^2 = 4x^2-1 \text{ or}$$

$$u = (4x^2-1)^{1/2}$$

$$dV/dx = \frac{1}{2}(4x^2-1)^{-1/2} \cdot 8x$$

$$dV/dx = 4x(4x^2-1)^{-1/2}$$

$$dx = \frac{(4x^2-1)^{1/2} du}{4x}$$

$$\int \frac{2x \cdot dx}{u}$$

$$2 \int \frac{x \cdot (4x^2-1)^{1/2} du}{4x}$$

$$\frac{2}{4} \int du$$

$$\frac{1}{2} (u)$$

$$\text{Ans} = \frac{1}{2} \sqrt{4x^2-1} + C$$

$$2) \int \frac{\sin^{-1} x}{\sqrt{1-x^2}} \cdot dx$$

Solution

$$\int \sin^{-1} x (1-x^2)^{1/2} \cdot dx$$

$$\text{let } u = \sin^{-1} x \text{ and } du =$$

$$(1-x^2)^{1/2} dx$$

$$\int u du = \frac{u^2}{2} + C$$

$$\text{Integration} = \frac{(\sin^{-1} x)^2}{2} + C$$

$$3) \int (\tan x)^6 \sec^2 x dx$$

$$\text{let } \tan x = u \text{ and } \sec^2 x dx =$$

$$du$$

$$\int (u)^6 du$$

$$\frac{u^7}{7} + C$$

$$\text{Ans} = \frac{(\tan x)^7}{7} + C$$