

19/MMS05/236

②

$$\int u du = \frac{u^2}{2} + c$$
$$= \frac{(\sin^{-1} x)^2}{2} + c$$

③ $\int (\tan x)^6 \sec^2 x dx$

let $u = \tan x$

$$du = \sec^2 x dx$$

We have

$$\int u^6 du = \frac{u^7}{7} + c$$

$$= \frac{(\tan x)^7}{7} + c$$

Name: Leslie David Chigi Naami
Matric Number: 19/MHS 01/236 (1)

ASSIGNMENT DEPARTMENT: MBBS

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

Let $u = \sqrt{4x^2-1}$
 $= (4x^2-1)^{1/2}$
 $\frac{du}{dx} = \frac{1}{2} (4x^2-1)^{-1/2} \cdot 8x$
 $\frac{du}{dx} = 4x (4x^2-1)^{-1/2}$
 $dx = \frac{du}{4x (4x^2-1)^{1/2}}$
 $dx = \frac{du}{4x (4x^2-1)^{1/2}}$

We have

$$\frac{2 \int x dx}{\sqrt{u}}$$
$$2 \int \frac{x}{\sqrt{(4x^2-1)^{1/2}}} \cdot \frac{(4x^2-1)^{1/2} du}{4x}$$
$$= \frac{1}{2} \int du$$
$$= \frac{1}{2} u + C$$
$$= \frac{1}{2} \sqrt{4x^2-1} + C$$

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

 $= \int \sin^{-1} x (1-x^2)^{-1/2} dx$
Let $u = \sin^{-1} x$
 $du = (1-x^2)^{-1/2} dx$

⑤
$$\int u du = \frac{u^2}{2}$$

 $= \frac{(\sin^{-1} x)^2}{2}$

③
$$\int (\tan x)^6 \sec^2 x$$

Let $u = \tan x$
 $du = \sec^2 x$
We have
$$\int u^6 du = \frac{u^7}{7}$$

 $= \frac{(\tan x)^7}{7}$