NAME: VICTORY - OPUTA FIDENCE DPUDOO
DEPT: MEDICINE AND SURGERY
MATRIC NO: 19/mhs01/438
COURSE CODE: MAT 104

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

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

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

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

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

We have:

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

$= \frac{1}{2}\int du$

$= \frac{1}{2}u + c = \frac{1}{2}\sqrt{4x^2-1}$

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

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

Let $u = \sin^{-1}x$

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

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

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

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

Let $u = \tan x$

$\frac{du}{d} \quad du = \sec^2 x \, dx$

We have

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

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