

OKORIE CILORY OLUWASEFUNMI

MEDICINE AND SURGERY

REG 19/MHS01/323

MAT 102 ASSIGNMENT

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

$$\text{let } b = \sqrt{4x^2-1}$$
$$= (4x^2-1)^{1/2}$$

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

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

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

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

$$\int \frac{2x}{\sqrt{4x^2-1}} dx = \frac{1}{2} b + c = \frac{1}{2} \sqrt{4x^2-1} + c$$

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

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

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

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

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

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

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

$$\text{let } u = \tan x$$

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

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

$$(\tan x)^6 \sec^2 x \, dx = \frac{(\tan x)^7}{7} + C$$