Dept: MBBS Course: MAT 104
S/n: 064
matric/no: 19/MHS 01/347
Name: ONIJAGBE ANGEL MORONIKEJI

Assignment

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

Solution

Let $u = 4x^2 - 1$

$\frac{du}{dx} = 8x$

$dx = \frac{du}{8x}$

Substitute $dx = du/8x$ into the question

$\int \frac{\cancel{2x}}{u^{1/2}} \times \frac{du}{\cancel{8x}}$

$\int \frac{du}{4(u)^{1/2}}$

$\frac{1}{4}\int u^{-1/2}\,du$

$\frac{1}{4}\left(\frac{u^{-1/2+1}}{-1/2+1}\right) + c$

$\frac{1}{4}\left(\frac{u^{1/2}}{1/2}\right) + c$

$\frac{1}{4}\left(2 \cdot u^{1/2}\right) + c$

$2/4\left(u^{1/2}\right) + c$

$1/2\left(u^{1/2}\right) + c$

Recall;

$u = 4x^2 - 1$

$1/2\left(4x^2-1\right)^{1/2} + c$

$y = 1/2\sqrt{4x^2-1} + c$

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

Solution

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

$\frac{du}{dx} = \frac{1}{\sqrt{1-x^2}}$

$du = \frac{1}{\sqrt{1-x^2}} \cdot dx$

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

Recall:

$du = \frac{1}{\sqrt{1-x^2}} dx$ and $u = \sin^{-1}x$

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

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

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

Solution

$u = \tan x$

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

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

$\int u^6 \cdot du$

$= \frac{u^{6+1}}{6+1} + c$

$= \frac{u^7}{7} + c$

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