

Assignment.

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course code: Maths 104

dept: Medicine and Surgery

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Ques no: -

Q1 $\int \frac{2x}{\sqrt{4x^2-1}} dx$

soln $u = 2x$ while $v = \sqrt{4x^2-1}$

$\frac{du}{v} = v = du \Rightarrow \int \frac{u}{v} = \int \frac{du}{v}$

$\int \frac{2x}{\sqrt{4x^2-1}} = \frac{(2x^2)}{2\sqrt{4x^2-1}} + C$

Q2 $\int \frac{\sin^{-1}x}{\sqrt{1-x^2}} dx$

soln $u = \sin^{-1}x$, $v = \sqrt{1-x^2}$

$\frac{du}{v} = v = du \Rightarrow \int \frac{u}{v} = \int \frac{du}{v}$

$\int \frac{\cos x}{\sqrt{1-x^2}} + C$

$$\textcircled{2} \int (\tan x)^b \sec x \, dx$$

$$u = \tan x, \quad v = \sec x$$

$$\int \frac{u}{v} = \int \frac{u'v - uv'}{v^2}$$

$$\int u \, dv = \frac{uv}{v^2} - \int \frac{u'v}{v^2} \, dx$$

$$\int u^b \, dv = \int \frac{u^b}{v} \cdot \frac{dv}{\tan x} = b$$

$$= \int \frac{(\tan x)^b}{\tan x} \times \frac{1}{\tan x} \, dx + c$$

$$\int \frac{(\tan x)^{b-1}}{\tan x} \, dx + c$$