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MEDICINE AND SURGERY

[illegible] 104 ASSIGNMENT III

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

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

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

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

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

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

we have,

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

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

$= \frac{1}{2} u + 6 = \frac{1}{2}\sqrt{4x^2-1} + 6$

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

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

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

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

$\int u \, du = u^2/2 + C$

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

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

let $u = \tan x$

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

we have

$\int u^6 \, du = u^7/7 + C$

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