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Assignment

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

$u = 4x^2 - 1$

$x = \sqrt{\frac{u+1}{4}} \therefore x = \frac{(u+1)^{1/2}}{2} = (u+1)^{1/2} \times \frac{1}{2}$

$\frac{dx}{du} \cdot (u+1)^{1/2} \times 0 + \frac{1}{2} \times \frac{1}{2} \times (u+1)^{-1/2}$

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

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

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

$\int 2x \cdot x \frac{1}{u^{1/2}} \times \frac{1}{4}(u+1)^{-1/2}\,du$

$\frac{1}{4}\int 2x \times \frac{u^{-1/2+1}}{1/2} \times (u+1)^{-1/2}\,du$

$\frac{1}{4} \times \frac{u^{1/2}}{1/2}$

$\frac{2}{4} \times \sqrt{4x^2-1} + C = \frac{1}{2}\sqrt{4x^2-1} + C$

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

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

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

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

$\int u \times du$

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

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

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

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

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

$u = \tan x^6$

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

$\int u^6 du$

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

$\frac{(\tan x)^{6+1}}{7} + C$

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

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