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 11/mhs 01/428
 Medicine and surgery
 mat 104

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

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

Let $u = 4x^2 - 1$
 $\frac{du}{dx} = 8$

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

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

$$\frac{2}{8} \int \frac{du}{u^{-1/2}} \quad \text{du} \times \frac{2}{8}$$

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

$$= \frac{1}{4} \left[\frac{u^{1/2}}{1/2} \right] du$$

$$\frac{1}{2} [4x^2 + 1] + C$$

$$\textcircled{2} \int \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx \quad *$$

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

Let $u = 1-x^2$

$$\frac{du}{dx} = -2x$$

$$x^2 = 1-u$$

$$dx = \frac{du}{-2x} \quad x = \frac{1-u}{-2x}$$

$$\int \frac{\sin^{-1} x}{u^{1/2}} \left(\frac{du}{-2x} \right)$$

$$\frac{\sin^{-1} x}{-2} \int \frac{du}{u^{1/2}}$$

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

$$- \int (\tan x)^6 (\sec^2 x) dx \quad | 10$$

$$u = \tan x \quad | 11$$

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

$$\int \tan^6 x + C$$

$$= \frac{(\tan x)^7}{7} + C \quad | 12$$

Special integrals

$$\int f(x) = \int f(x)$$

$$\int x^n = \frac{x^{n+1}}{n+1}$$