

28.11 Integration Using Tables

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$$\begin{aligned} \textcircled{12} \int \frac{dx}{x^2-4} & \quad \text{use integral \# 9} \quad a=\sqrt{4}=2 \quad u=x \quad du=dx \\ & = \frac{1}{2(2)} \ln\left(\frac{x-2}{x+2}\right) + C = \frac{1}{4} \ln\left(\frac{x-2}{x+2}\right) + C \end{aligned}$$

$$\begin{aligned} \textcircled{10} \int \frac{4x}{1+2x+x^2} dx & = 4 \int \frac{x}{(x+1)^2} dx \quad \text{use integral \# 3} \quad a=1, b=1, u=x, du=dx \\ & = 4 \left[\frac{1}{(1)^2} \left(\frac{1}{1+x} + \ln(1+x) \right) \right] + C \\ & = 4 \left[\frac{1}{1+x} + \ln(1+x) \right] + C \end{aligned}$$

$$\begin{aligned} \textcircled{16} \int 6 \sin^{-1} 3x dx & \quad \text{use integral \# 5} \quad u=3x \quad du=3 dx \\ & = 6 \left(\frac{1}{3} \right) \int \sin^{-1} 3x (3) dx = 2 \left[3x \sin^{-1} 3x + \sqrt{1-(3x)^2} \right] + C \\ & = 6x \sin^{-1} 3x + 2\sqrt{1-9x^2} + C \end{aligned}$$

$$\begin{aligned} \textcircled{26} \int \frac{\sqrt{9+x^2}}{x} dx & \quad \text{use integral \# 16} \quad a=\sqrt{9}=3 \quad u=x \quad du=dx \\ & = \sqrt{x^2+9} - 3 \ln\left(\frac{3+\sqrt{x^2+9}}{x}\right) + C \end{aligned}$$

$$(x+3)^2 = x^2 + 6x + 9$$

$$\int (25-x^2)^{3/2} dx \quad \text{use integral \# 20} \quad a=\sqrt{25}=5 \quad u=x \quad du=dx$$

$$= \frac{x}{4} (25-x^2)^{3/2} + \frac{3(5)^2 x}{8} \sqrt{25-x^2} + \frac{3(5)^4}{8} \sin^{-1} \frac{x}{5} + C$$

$$= \frac{x}{4} (25-x^2)^{3/2} + \frac{75}{8} x \sqrt{25-x^2} + \frac{1875}{8} \sin^{-1} \frac{x}{5} + C$$