



Indefinite Integrals Ex 19.3 Q1

Let $I = \int [2x - 3]^5 + \sqrt{3x + 2} dx$. Then,

$$\begin{aligned} I &= \int (2x - 3)^5 dx + \int (3x + 2)^{\frac{1}{2}} dx \\ &= \frac{(2x - 3)^6}{2 \times 6} + \frac{(3x + 2)^{\frac{3}{2}}}{3 \times \frac{3}{2}} + C \\ &= \frac{(2x - 3)^6}{12} + \frac{2}{9} (3x + 2)^{\frac{3}{2}} + C \end{aligned}$$

$$\therefore I = \frac{(2x - 3)^6}{12} + \frac{2}{9} (3x + 2)^{\frac{3}{2}} + C$$

Indefinite Integrals Ex 19.3 Q2

Let $I = \int \left[\frac{1}{(7x - 5)^3} + \frac{1}{\sqrt{5x - 4}} \right] dx$. Then,

$$\begin{aligned} I &= \int (7x - 5)^{-3} dx + \int (5x - 4)^{-\frac{1}{2}} dx \\ &= \frac{(7x - 5)^{-2}}{7 \times (-2)} + \frac{(5x - 4)^{\frac{1}{2}}}{5 \times \frac{1}{2}} + C \\ &= -\frac{(7x - 5)^{6-2}}{14} + \frac{2}{5} \sqrt{(5x - 4)} + C \end{aligned}$$

$$\therefore I = \frac{-1}{14} (7x - 5)^{-2} + \frac{2}{5} \times \sqrt{5x - 4} + C.$$

Indefinite Integrals Ex 19.3 Q3

Let $I = \int \frac{1}{2-3x} + \frac{1}{\sqrt{3x-2}} dx$. Then,

$$\begin{aligned} I &= \int \frac{1}{2-3x} dx + \int \frac{1}{\sqrt{3x-2}} dx \\ &= \frac{\log|2-3x|}{-3} + \frac{2}{3}(3x-2)^{\frac{1}{2}} c \\ &= \frac{-1}{3} \times \log|2x-3| + \frac{2}{3} \times \sqrt{3x-2} + c \end{aligned}$$

Indefinite Integrals Ex 19.3 Q4

Let $I = \int \frac{x+3}{(x+1)^4} dx$. Then,

$$\begin{aligned} I &= \int \frac{x+1+2}{(x+1)^4} dx \\ &= \int \frac{x+1}{(x+1)^4} \times dx + 2 \int \frac{1}{(x+1)^4} \times dx \\ &= \int \frac{1}{(x+1)^3} \times dx + 2 \int \frac{1}{(x+1)^4} \times dx \\ &= \int (x+1)^{-3} \times dx + 2 \int (x+1)^{-4} dx \\ &= \frac{(x+1)^{-2}}{-2} + 2 \frac{(x+1)^{-3}}{-3} + c \\ &= -\frac{1}{2} \times \frac{1}{(x+1)^2} - \frac{2}{3} \times \frac{1}{(x+1)^3} + c \end{aligned}$$

$$\therefore I = \frac{-1}{2(x+1)^2} - \frac{2}{3(x+1)^3} + c$$

Indefinite Integrals Ex 19.3 Q5

Let $I = \int \frac{1}{\sqrt{x+1} + \sqrt{x}} dx$. Then,

$$\begin{aligned} I &= \int \frac{1}{\sqrt{x+1} + \sqrt{x}} \times \frac{\sqrt{x+1} - \sqrt{x}}{\sqrt{x+1} - \sqrt{x}} \times dx \\ &= \int \frac{\sqrt{x+1} - \sqrt{x}}{(\sqrt{x+1})^2 - (\sqrt{x})^2} \times dx \\ &= \int \frac{\sqrt{x+1} - \sqrt{x}}{x+1-x} \times dx \\ &= \int (\sqrt{x+1} - \sqrt{x}) \times dx \\ &= \int (x+1)^{\frac{1}{2}} dx - \int x^{\frac{1}{2}} dx \\ &= \frac{2}{3}(x+1)^{\frac{3}{2}} - \frac{2}{3}x^{\frac{3}{2}} + c \end{aligned}$$

$$\therefore I = \frac{2}{3}(x+1)^{\frac{3}{2}} - \frac{2}{3}x^{\frac{3}{2}} + c.$$

***** END *****

