



Indefinite Integrals Ex 19.4 Q4

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

$$\begin{aligned} I &= \int \frac{2x+2-2+3}{(x-1)^2} dx \\ &= \int \frac{2x-2+5}{(x-1)^2} dx \\ &= 2 \int \frac{(x-1)}{(x-1)^2} dx + 5 \int \frac{1}{(x-1)^2} dx \\ &= 2 \int \frac{1}{x-1} dx + 5 \int (x-1)^{-2} dx \\ &= 2 \log|x-1| + 5 \times \frac{(x-1)^{-1}}{-1} + c \\ &= 2 \log|x-1| - \frac{5}{x-1} + c \end{aligned}$$

$$\therefore I = 2 \log|x-1| - \frac{5}{x-1} + c.$$

Indefinite Integrals Ex 19.4 Q5

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

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

$$\therefore I = x + \log|x + 1| + \frac{3}{x + 1} + c$$

Indefinite Integrals Ex 19.4 Q6

Let  $I = \int \frac{2x - 1}{(x - 1)^2} dx$ . Then,

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

$$\therefore I = \frac{-1}{x - 1} + 2 \log|x - 1| + c.$$

\*\*\*\*\* END \*\*\*\*\*