



Indefinite Integrals Ex 19.7 Q1

Let $I = \int \sin 4x \cos 7x dx$. Then,

$$\begin{aligned} I &= \frac{1}{2} \int 2 \sin 4x \times \cos 7x dx \\ &= \frac{1}{2} \int (\sin 11x + \sin(-3x)) dx \\ &= \frac{1}{2} \int \sin 11x dx - \frac{1}{2} \int \sin 3x dx \\ &= \frac{-1}{2 \times 11} \times \cos 11x + \frac{1}{2 \times 3} \cos 3x + c \\ &= -\frac{1}{22} \times \cos 11x + \frac{1}{6} \times \cos 3x + c \end{aligned}$$

$$\therefore I = -\frac{1}{22} \times \cos 11x + \frac{1}{6} \times \cos 3x + c.$$

Indefinite Integrals Ex 19.7 Q2

Let $I = \int \cos 3x \cos 4x dx$. Then,

$$\begin{aligned} I &= \frac{1}{2} \int (2 \cos 3x \cos 4x) \times dx \\ &= \frac{1}{2} \int (\cos 7x + \cos(-x)) dx \\ &= \frac{1}{2} \int \cos 7x + \frac{1}{2} \int \cos x dx & [\because \cos(-x) = \cos x] \\ &= \frac{\sin 7x}{2 \times 7} + \frac{\sin x}{2} + c \\ &= \frac{1}{14} \times \sin 7x + \frac{1}{2} \sin x + c \end{aligned}$$

$$\therefore I = \frac{1}{14} \times \sin 7x + \frac{1}{2} \times \sin x + c.$$

Indefinite Integrals Ex 19.7 Q3

Let $I = \int \cos mx \cos nx dx$ $m \neq n$. Then,

$$\begin{aligned} I &= \frac{1}{2} \int 2 \cos mx \cos nx dx \\ &= \frac{1}{2} \int [\cos(m+n)x + \cos(m-n)x] dx \\ &= \frac{1}{2} \times \frac{\sin(m+n)x}{m+n} + \frac{1}{2} \times \frac{\sin(m-n)x}{m-n} + c \end{aligned}$$

$$\therefore I = \frac{1}{2} \left[\frac{\sin(m+n)x}{m+n} + \frac{\sin(m-n)x}{m-n} \right] + c.$$

Indefinite Integrals Ex 19.7 Q4

We have,

$$\begin{aligned}& \int \sin mx \cos nx \, dx, \, m \neq n \\&= \frac{1}{2} \int 2 \sin mx \cos nx \, dx \\&= \frac{1}{2} \int [\sin(m+n)x + \sin(m-n)x] dx \\&= \frac{1}{2} \times \left[\frac{-\cos(m+n)x}{m+n} - \frac{\cos(m-n)x}{m-n} \right] + c\end{aligned}$$

$$\therefore \int \sin mx \cos nx = \frac{1}{2} \left[\frac{-\cos(m+n)x}{m+n} - \frac{\cos(m-n)x}{m-n} \right] + c.$$

***** END *****