Indefinite Integrals Ex 19.6 Q1

$$\sin^2(2x+5)=\frac{1-\cos 2(2x+5)}{2}=\frac{1-\cos(4x+10)}{2}$$

$$\Rightarrow \int \sin^2(2x+5)\,dx=\int \frac{1-\cos(4x+10)}{2}dx$$

$$=\frac{1}{2}\int 1\,dx-\frac{1}{2}\int \cos(4x+10)\,dx$$

$$=\frac{1}{2}x-\frac{1}{2}\left(\frac{\sin(4x+10)}{4}\right)+C$$

$$=\frac{1}{2}x-\frac{1}{8}\sin(4x+10)+C$$

Indefinite Integrals Ex 19.6 Q2

We need to evaluate $\int \sin^3(2x+1)dx$

by using the formula $\rightarrow \sin 3\theta=-4\sin^3\theta+3\sin\theta$

$$\therefore \sin^3(2x+1)=\frac{3\sin(2x+1)-\sin 3(2x+1)}{4}$$

$$\int \sin^3(2x+1)dx$$

$$=\int \frac{3\sin(2x+1)-\sin 3(2x+1)}{4}dx$$

$$=\int \frac{3\sin(2x+1)-\sin 3(2x+1)}{4}dx$$

$$=-\frac{3}{8}\cos(2x+1)+\frac{1}{24}\cos 3(2x+1)+C$$

Indefinite Integrals Ex 19.6 Q3

Evaluate the integral as follows

$$1 \quad \int \cos^4 2x dx = \int \left(\cos^2 2x\right)^2 dx$$

$$= \int \left(\frac{1}{2}(\cos 4x + 1)\right)^2 dx$$

$$= \int \left(\frac{1}{4}\left(\cos^2 4x\right) + \frac{1}{4} + \frac{\cos 4x}{2}\right) dx$$

$$= \int \left(\frac{1}{4}\left(\frac{1}{2}(\cos 8x + 1)\right) + \frac{1}{4} + \frac{\cos 4x}{2}\right) dx$$

$$= \int \frac{1}{8}\left(\cos 8x + \frac{3}{8} + \frac{\cos 4x}{2}\right) dx$$

$$= \frac{1}{64}\sin 8x + \frac{3}{8}x + \frac{1}{8}\sin 4x + C$$

Indefinite Integrals Ex 19.6 Q4

Let $I = \int \sin^2 bx dx$. Then,

$$I = \int \frac{1 - \cos 2bx}{2} \times dx$$

$$= \frac{1}{2}\int dx - \frac{1}{2}\int \cos 2bx dx$$

$$= \frac{1}{2}x - \frac{1}{2}\frac{\sin(2bx)}{2b} + c$$

$$\therefore \qquad I = \frac{x}{2} - \frac{\sin 2bx}{4b} + c$$

*********** END **********