



Indefinite Integrals Ex 19.27 Q10

$$\text{Let } I = \int e^{2x} \cos^2 x dx$$

$$= \frac{1}{2} \int e^{2x} 2 \cos^2 x dx$$

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

$$= \frac{1}{2} \int e^{2x} dx + \frac{1}{2} \int e^{2x} \cos 2x dx$$

$$\therefore \int e^{ax} \cos bx dx = \frac{e^{ax}}{a^2 + b^2} \{a \cos bx - b \sin bx\} + c$$

$$\therefore I = \frac{1}{4} e^{2x} + \frac{1}{2} \frac{e^{2x}}{8} \{2 \cos 2x + 2 \sin 2x\} + c$$

Hence,

$$I = \frac{e^{2x}}{4} + \frac{e^{2x}}{16} \{2 \cos 2x + 2 \sin 2x\} + c$$

or

$$I = \frac{e^{2x}}{4} + \frac{e^{2x}}{8} \{\cos 2x + \sin 2x\} + c$$

Indefinite Integrals Ex 19.27 Q11

$$\text{Let } I = \int e^{-2x} \sin x dx$$

$$\therefore \int e^{ax} \sin bx = \frac{e^{ax}}{a^2 + b^2} \{a \sin bx - b \cos bx\} + c$$

$$\therefore I = \frac{e^{-2x}}{5} \{-2 \sin x - \cos x\} + c$$

Indefinite Integrals Ex 19.27 Q12

$$\text{Let } I = \int x^2 e^{x^3} \cos x^3 dx$$

$$\text{Let } x^3 = t$$

$$\Rightarrow 3x^2 dx = dt$$

$$\therefore I = \frac{1}{3} \int e^t \cos t dt$$

$$\therefore \int e^{ax} \cos bx dx = \frac{e^{ax}}{a^2 + b^2} \{a \cos bx + b \sin bx\} + c$$

$$\therefore I = \frac{1}{3} \left\{ \frac{e^t}{2} (\cos t + \sin t) \right\} + c$$

$$\therefore I = \frac{1}{3} \left\{ \frac{e^{x^3}}{2} (\cos x^3 + \sin x^3) \right\} + c$$

***** END *****