

Problem 26, Section 6.2

Calculate the indefinite integral  $\int (e^{2x} + e^{-3x}) dx$ .

Well,

$$\int (e^{2x} + e^{-3x}) dx = \int e^{2x} dx + \int e^{-3x} dx.$$

To calculate  $\int e^{2x} dx$ , set  $u = 2x$ . Then

$$du = 2dx \implies \frac{du}{2} = dx.$$

Substituting, we get

$$\int e^{2x} dx = \frac{1}{2} \int e^u du = \frac{1}{2} e^u + c = \frac{1}{2} e^{2x} + c.$$

Using the same method,  $\int e^{-3x} dx = -\frac{1}{3} e^{-3x} + c$ . Therefore,

$$\int (e^{2x} + e^{-3x}) dx = \frac{1}{2} e^{2x} - \frac{1}{3} e^{-3x} + c.$$