

4.  $\int x^2 e^x dx$

$$u = x^2 \quad dv = e^x dx$$

$$du = 2x dx \quad v = e^x$$

$$\int u dv = uv - \int v du$$

$$= x^2 \cdot e^x - \int e^x \cdot 2x dx$$

$$= \underline{x^2 e^x - 2x e^x - 2e^x + c}$$

$$\int e^x 2x dx$$

~~$$u = e^x \quad dv = 2x dx$$~~

$$u = 2x \quad dv = e^x dx$$

$$du = 2 dx \quad v = e^x$$

$$\int u dv = uv - \int v du$$

$$= 2x \cdot e^x - \int e^x \cdot 2 dx$$

$$= 2x e^x - \underline{\int 2 e^x dx}$$

$$\Downarrow$$

$$2 \int e^x dx$$

$$2x e^x - 2(e^x + c)$$