§7.2 #73

$$\int_0^5 e^{-3x}\,dx = \frac{-1}{3}e^{-3x}\Big|_0^5 = \frac{-1}{3}\left(e^{-15} - e^0\right) = \boxed{\frac{1}{3}\left(1 - \frac{1}{e^{15}}\right)}$$

(note $\int e^{-3x}dx = \frac{-1}{3}\int e^u du$ letting $u = -3x$ thus $\int e^{-3x}dx = \frac{-1}{3}e^{-3x} + C$)

§7.2 #77

$$\int \left(e^x + e^{-x}\right)^2 dx = \int \left(e^{2x} + 2 + e^{-2x}\right)dx = \boxed{\frac{1}{2}e^{2x} + 2x - \frac{1}{2}e^{-2x} + C}$$

(I used $u = 2x$ and $u = -2x$ implicitly in the calculation 5)

§7.2 #79

$$\int e^{\cos(x)}\sin(x)\,dx = \int e^u(-du) \leftarrow \boxed{\begin{array}{l} u = \cos(x) \\ du = -\sin(x)\,dx \end{array}}$$

$$= -e^u + C = \boxed{-e^{\cos(x)} + C}$$

§7.2 #81

$$\int e^{\sqrt{x}}\frac{dx}{\sqrt{x}} = \int e^u(2\,du) \leftarrow \boxed{\begin{array}{l} u = \sqrt{x} \\ du = \frac{dx}{2\sqrt{x}} \therefore \frac{dx}{\sqrt{x}} = 2du \end{array}}$$

$$= 2e^u + C = \boxed{2e^{\sqrt{x}} + C}$$