Quiz 6 Week 12

Solution

Q: Evaluate the integral $I = \int e^{\sqrt{x}}\, dx$

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① Let $\sqrt{x} = t \Rightarrow x = t^2$
then $dx = 2t\, dt$

$$\Rightarrow I = 2\int t e^t\, dt$$

② Let $u = t$, $dv = e^t dt$
then $du = dt$, $v = e^t$

Integration by parts

$$\Rightarrow I = 2\left[t e^t - \int e^t dt\right]$$

$$= 2\left[t e^t - e^t + C_0\right]$$

$$= 2te^t - 2e^t + C_1$$

$$= \boxed{2\sqrt{x}e^{\sqrt{x}} - 2e^{\sqrt{x}} + C_1}$$