

$$\left(\frac{u(x)}{v(x)} \right)' = \frac{u'(x)v(x) - u(x)v'(x)}{v^2(x)} \quad \text{نعلم أن :}$$

$$\frac{x e^x - e^x}{x^2} = \frac{x (e^x)' - (x)' e^x}{x^2} = \left(\frac{e^x}{x} \right)' \quad \text{* لدينا :}$$

$$\begin{aligned} J_1 &= \int_1^{\ln 2} \frac{x e^x - e^x}{x^2} dx && \text{إذن :} \\ &= \left[\frac{e^x}{x} \right]_1^{\ln 2} = \frac{2}{\ln 2} - e \end{aligned}$$

$$\frac{1 - \ln x}{x^2} = \frac{x \cdot (\ln x)' - (x)' \ln x}{x^2} = \left(\frac{\ln x}{x} \right)' \quad \text{* لدينا :}$$

$$\begin{aligned} J_2 &= \int_1^e \frac{1 - \ln x}{x^2} dx && \text{إذن :} \\ &= \left[\frac{\ln x}{x} \right]_1^e = \frac{1}{e} \end{aligned}$$

$$\frac{\cos x e^x + \sin x e^x}{\cos^2 x} = \frac{\cos x \cdot (e^x)' - (\cos x)' e^x}{\cos^2 x} = \left(\frac{e^x}{\cos x} \right)' \quad \text{* لدينا :}$$

$$\begin{aligned} J_3 &= \int_0^{\frac{\pi}{6}} \frac{\cos e^x + \sin x e^x}{\cos^2 x} dx \\ &= \left[\frac{e^x}{\cos x} \right]_0^{\frac{\pi}{6}} \\ &= \frac{21}{y^3} - 1 \end{aligned}$$

$$\begin{aligned} J_4 &= \int_1^{\ln 3} \frac{e^x - x e^x}{e^{2x}} dx \\ &= \left[\frac{x}{e^x} \right]_1^{\ln 3} \\ &= \frac{\ln 3}{3} - \frac{1}{e} \end{aligned}$$

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