

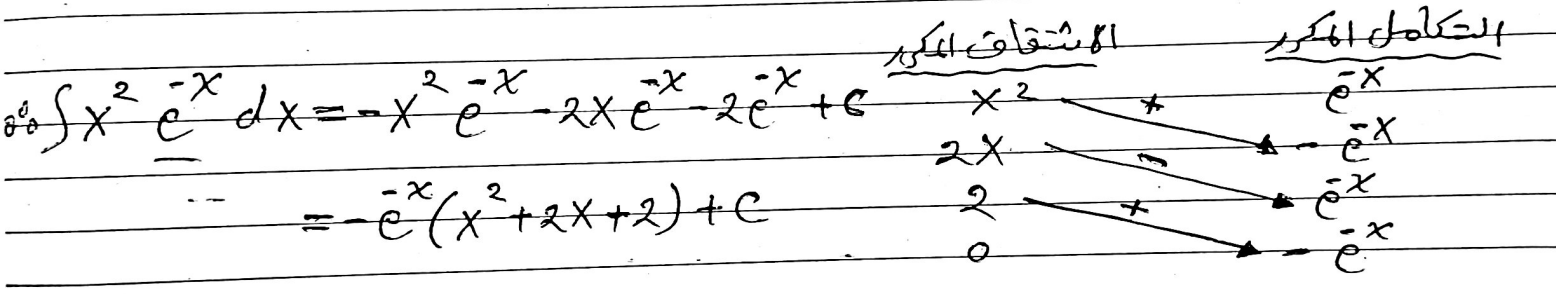
∴ $\int x^2 \cos x dx = x^2 \sin x + 2x \cos x - 2 \sin x + c$

- Ⓐ $\int x e^x dx$ (ch) Ⓑ $\int x^2 e^{-x} dx$ Ⓒ $\int x^2 \sqrt{x-1} dx$ (ch)

Ⓑ $\int x^2 e^{-x} dx$

طريقة الجزئية (واب.ج)

الطريقة الجبرية $p(x) = x^2$ متزايدة و $q(x) = e^{-x}$ متناقص



∴ $\int x^2 e^{-x} dx = -x^2 e^{-x} - 2x e^{-x} - 2e^{-x} + c$
 $= -e^{-x}(x^2 + 2x + 2) + c$

- Ⓔ Ⓐ $\int \tan^{-1}(3x) dx$ Ⓑ $\int \sin^{-1}(2x) dx$ (ch) Ⓒ $\int x \sec^{-1} x dx$

Ⓐ $\int \tan^{-1}(3x) dx$

$u = \tan^{-1}(3x)$ $dv = dx$
 $du = \frac{3 dx}{1+(3x)^2}$ $v = x$

∴ $\int \tan^{-1}(3x) dx = \int u dv = uv - \int v du$

ex: $\int e^{\sqrt{x}} dx$
 let $u = \sqrt{x}$ $dx = 2\sqrt{x} dx$
 $du = \frac{dx}{2\sqrt{x}} \Rightarrow dx = 2\sqrt{x} du$
 $\therefore \int u e^u du$
 let $w = u$, $dv = e^u$
 $dw = du$, $v = e^u$
 $\therefore \int e^{\sqrt{x}} dx = 2 \int u e^u du =$

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 ونفوضه بدل كل

$= uv - \int v du$
 $= 2[ue^u - \int e^u du] = 2(ue^u - e^u + c)$