


3. $\int_1^3 \frac{\ln x \cdot dx}{u \cdot dv}$

$\int u dv = uv - \int v du$
 $u = \ln x \quad du = \frac{1}{x} dx$
 $v = x \quad dv = dx$

$= x \ln x - \int x \cdot \frac{1}{x} dx$
 $= x \ln x - \int 1 dx$
 $= x \ln x - x \Big|_1^3$

$(3 \ln 3 - 3) + (-\ln 1 + 1)$
 $3 \ln 3 - 2 = 0.2958 u^2$




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

$\int u dv = uv - \int v du$
 $u = x^2 \quad du = 2x dx$
 $v = \sin x \quad dv = \cos x dx$

$= x^2 \sin x - \int \sin x \cdot 2x dx$
 $u = 2x \quad du = 2 dx$
 $v = -\cos x \quad dv = \sin x dx$

$= x^2 \sin x - [uv - \int v du]$

$= x^2 \sin x - [2x \cos x - \int -2 \cos x dx]$
 $= x^2 \sin x - [-2x \cos x + 2 \sin x + C]$
 $= x^2 \sin x + 2x \cos x - 2 \sin x + C$



1. $\int 3t e^t dt$ $v = \frac{1}{2} e^{2x} \quad dv = e^{2x} dx$

2. $\int 3x^2 e^{2x} dx$ $du = \frac{1}{x} \cdot \frac{1}{2} x^{-2}$
 $= \frac{1}{2} \cdot \frac{1}{x}$

3. $\int \ln \sqrt{x} dx$ $u = \ln \sqrt{x}$
 $dv = dx$