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1 $x^2 \sin x$

$u = x^2$ $v = \sin x$

$\frac{du}{dx} = 2x$ $\frac{dv}{dx} = -\cos x$

$\int u\,dv = uv - \int v\,dy$

$= -x^2 \cos x - \int -\cos x (2x)\,dx$

$-x^2 \cos x - \int -2x \cos x\,dx$

$u = -2x$ $v = \sin x$

$\frac{du}{dx} = -2$ $dv = \cos x\,dx$

$-x^2 \cos x - 2x \sin x - 2\int \cos x\,dx$

$-x^2 \cos x - 2x \sin x - 2(\sin x)$

$= -x^2 \cos x - 2x \sin x + 2\cos x + C$

(2) $\int 3te^{2t}\,dt = \left[\frac{3}{2}te^{2t} - \frac{3e^{2t}}{4}\right] + C$

(3) $\int 2x^2 \ln x\,dx = \left[\frac{2}{3}x^3(\ln x - \frac{1}{3})\right] + C$

(4) $\int \frac{(2x - 3x^2)}{(1-x)}$

$-x+1 \;\overline{)\; -3x^2 + 2x}$

$3x + 1$

$-3x^2 + 3x$

$-x$

$-x + 1$

-1

$$\int (3x+1)\,dx + \int \left(\frac{-1}{-x+1}\right) dx$$

$$\frac{3x^2}{2} + x - \ln(-x+1) + C$$