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(91) $\int_0^1 y e^{-2y^2} dy$ $\quad u = -2y^2 \quad u(1) = -2(1)^2 = -2$

$du = -4y\,dy \quad u(0) = -2(0)^2 = 0$

$-\frac{1}{4}\int_{u(0)}^{u(1)} e^u du \quad -\frac{1}{4}du = y\,dy$

$-\frac{1}{4}e^u\Big]_0^{-2} = -\frac{1}{4}e^{-2} - -\frac{1}{4}e^0 = \boxed{-\frac{1}{4e^2} + \frac{1}{4}}$

(93) $\int_2^4 \frac{1+x-x^2}{x^2}dx = \int_2^4 \frac{1}{x^2} + \frac{1}{x} - 1\,dx$

$= -1x^{-1} + \ln|x| - x\Big]_2^4 = -\frac{1}{4} + \ln 4 - 4 - \left(-\frac{1}{2} + \ln 2 - 2\right)$

$= -\frac{1}{4} - 2 + \underbrace{\ln 4 - \ln 2}_{\ln\left(\frac{4}{2}\right)}$

$= \boxed{-\frac{7}{4} + \ln 2}$

(95) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}}dx$

$u = \sqrt{x} = x^{1/2}$

$\frac{du}{dx} = \frac{1}{2}x^{-1/2}$

$2du = \frac{1}{\sqrt{x}}dx$

$= 2\int e^u du$

$= 2e^u + C$

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

(97) $\int \frac{x+1}{x^2+2x}dx$

$u = x^2 + 2x$

$du = 2x + 2\,dx$

$du = 2(x+1)dx$

$\frac{1}{2}du = x+1\,dx$

$= \frac{1}{2}\int \frac{1}{u}du$

$= \frac{1}{2}\ln|u| + C$

$= \frac{1}{2}\ln|x^2+2x| + C$

(99) $\int \underbrace{\tan x}_{du}\, \underbrace{\ln(\cos x)}_{u}\, dx$

$u = \ln(\cos x)$

$du = \frac{1}{\cos x} \cdot -\sin x\,dx$

$du = -\frac{\sin x}{\cos x}dx = -\tan x\,dx$

$= -\int u\,du$

$= -\frac{1}{2}u^2 + C$

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

(101) $\int 2^{\tan\theta} \sec^2\theta \, d\theta$ $\quad u = \tan\theta$

$du = \sec^2\theta \, d\theta$

$= \int 2^u \, du$

$= \frac{2^u}{\ln 2} + C = \boxed{\frac{2^{\tan\theta}}{\ln 2} + C}$

(103) $\int \frac{\sec\theta \tan\theta}{1+\sec\theta} \, d\theta$ $\quad u = 1+\sec\theta$

$du = 0 + \sec\theta \tan\theta \, d\theta$

$= \int \frac{1}{u} \, du$

$= \ln|u| + C = \ln|1+\sec\theta| + C$