3 / 4 167%

10) $\int \frac{dx}{x \ln x^4}$

$u = \ln(x^4)$

$du = \frac{4x^3}{x^4} = \frac{4}{x}\,dx$

$\frac{1}{4}\,du = \frac{1}{x}\,dx$

$\frac{1}{4}\int \frac{1}{u}\,du = \frac{1}{4}\ln u + C$

$= \frac{1}{4}\ln\left(\ln(x^4)\right) + C$

e^-2x for the test...)

10) ______________

11) ______________

12) ______________

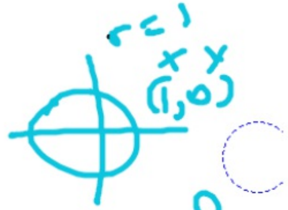
13) ______________

Solve the initial value problem.

11) $\int \frac{dy}{dx} = \int x \sin 4x$ and $y = 4$ when $x = 0$ 11) ______________

$y = \int x \sin 4x$

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



$\sin\theta = \frac{y}{r} = \frac{0}{1}$

$u = x \qquad dv = \sin 4x\,dx$

$du = 1\,dx \qquad v = -\frac{1}{4}\cos 4x$

$y = \int x \sin 4x\,dx = (x)\left(-\frac{1}{4}\cos 4x\right) - \int -\frac{1}{4}\cos 4x\,dx + C$

$y = -\frac{x}{4}\cos 4x + \frac{1}{4}\int \cos 4x\,dx + C$

$y = \frac{-x}{4}\cos 4x + \frac{1}{4}\left(\frac{1}{4}\sin 4x\right) + C$

$4 = 0 + 0 + C \qquad C = -4$

12) $\frac{dy}{dx} = x\,e^{-2x}$ and $y = 6$ when $x = 0$

$y = \int x e^{-2x}\,dx + C = (x)\left(-\frac{1}{2}e^{-2x}\right) - \int\left(-\frac{1}{2}e^{-2x}\right)dx$

$u = x \qquad dv = e^{-2x}\,dx$

$du = dx \qquad v = -\frac{1}{2}e^{-2x}$

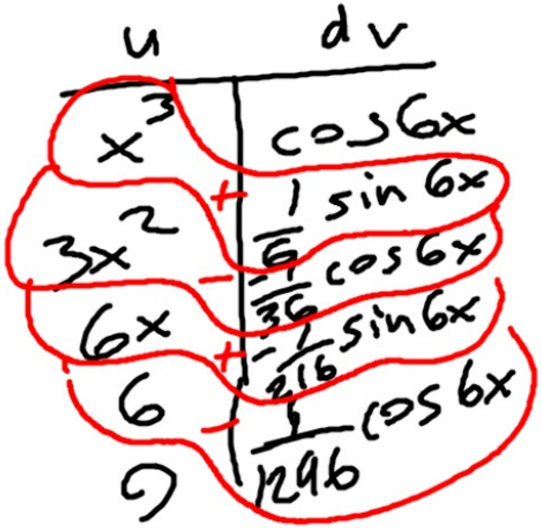
$= \frac{-x}{2}e^{-2x} + \frac{1}{2}\int e^{-2x}\,dx + C$

$y = \frac{-x}{2}e^{-2x} - \frac{1}{4}e^{-2x} + C$

$6 = 0 - \frac{1}{4} + C \qquad C = 6\frac{1}{4} = \frac{25}{4}$

Use tabular integration to find the antiderivative.

13) $\int x^3 \cos 6x \, dx$ (fair warning–I could replace cos 6x with e^–2x for the test...) 13) ______________



$$= \frac{x^3}{6}\sin 6x + \frac{3x^2}{36}\cos 6x - \frac{6x}{216}\sin 6x - \frac{6}{1296}\cos 6x + C$$