(24) $2xy' + y^3 e^{-2x} = 2xy$

$$\frac{2xy' - 2xy = -y^3 e^{-2x}}{2x}$$

$$y' - y = \frac{-y^3 e^{-2x}}{2x}$$

$u = y^{1-3}$

$u = y^{-2}$

$u^{-1/2} = y$

$$\frac{dy}{dx} = -\frac{1}{2} u^{-3/2} \frac{du}{dx}$$

$$-\frac{1}{2} u^{-3/2} \frac{du}{dx} - u^{-1/2} = -\frac{\left[u^{-1/2}\right]^3 e^{-2x}}{2x}$$

$$\frac{du}{dx} + 2u = -\frac{\left[u^{-3/2}\right] e^{-2x} (-2)}{2x\, u^{-3/2}}$$

$$\frac{du}{dx} + 2u = \frac{e^{-2x}}{x}$$

$$\int e^{2x}\, dx = e^{2x}$$

$$e^{2x} u' + 2u e^{2x} = \frac{e^{-2x} e^{2x}}{x}$$

$$e^{2x} u' + 2u e^{2x} = \frac{1}{x}$$

$$\frac{d}{dx}\left(e^{2x} u\right) = \frac{1}{x}$$

$$e^{2x} w = \int \frac{1}{x} dx$$

$$e^{2x} w = \ln x + c$$

$$w = \frac{\ln x + c}{e^{2x}}$$

$$y^{-2} = \frac{\ln x + c}{e^{2x}}$$

$$\frac{e^{2x}}{\ln x + c} = y^2$$

$$\sqrt{\frac{e^{2x}}{\ln x + c}} = y$$