3450:335 Ordinary Differential Equations, Kreider

Name: _____

Quiz 4, Section 2.5, due on _____

(10 pts) Solve the Bernoulli equation $\frac{dy}{dx} - y = e^x y^{-2}$.

$u = y^{1-n} = y^3$

$u' = 3y^2 y'$

multiply by $3y^2$

$3y^2 y' - 3y^2 \cdot y = 3e^x$

$u' - 3u = 3e^x$

$p = -3 \quad k = e^{-3x}$

multiply by e^{-3x}

$\frac{d}{dx}\left(e^{-3x} u\right) = 3e^{-2x}$

$e^{-3x} u = -\frac{3}{2} e^{-2x} + c$

$u = -\frac{3}{2} e^x + ce^{3x}$

$y^3 = \quad "$

$y = \left(-\frac{3}{2} e^x + ce^{3x}\right)^{1/3}$