

Quiz 4

$$1/ \quad y' + \frac{1}{x}y = x^2 y^{-2}$$

$$v = y^{-1} \quad v' = -y^{-2} y'$$

$$y^{-2} y' + \frac{1}{x} y^{-1} = x^2$$

~~1/2~~

$$\Rightarrow -v' + \frac{1}{x} v = x^2$$

$$\Rightarrow v' - \frac{1}{x} v = -x^2$$

$$\mu = e^{\int -\frac{1}{x} dx} = \frac{1}{x}$$

$$\Rightarrow \left(\frac{1}{x} v\right)' = -x$$

$$\Rightarrow \frac{1}{x} v = -\frac{1}{2} x^2 + C \Rightarrow v = -\frac{1}{2} x^3 + Cx$$

$$\Rightarrow \boxed{y^{-1} = -\frac{1}{2} x^3 + Cx}$$

$$2/ \quad \begin{bmatrix} 1 & 2 & 0 \\ 0 & -1 & 1 \\ 1 & 3 & -2 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 2 & 0 \\ 0 & -1 & 1 \\ 0 & 1 & -2 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 2 & 0 \\ 0 & -1 & 1 \\ 0 & 0 & -1 \end{bmatrix} \rightarrow \underline{\underline{L.I}}$$