## MATH 246 Homework 1.3

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## Directions:

- Work should be done neatly and on separate paper.
- Enough work must be shown so that the steps you are taking is clear.

1. Determine if each of the following is any of explicit, first order linear, and/or separable. It may be more than one type or none at all. No justification is required.
(a) $y^{\prime}=y t$
(b) $y^{\prime}=y+t$
(c) $y^{\prime}=y+y t$
(d) $y^{\prime}=y y^{\prime}+t$
(e) $y^{\prime}=t$
2. Explicitly solve the separable differential equation $y^{\prime}=3 t^{2} e^{y}+e^{y}$.
3. Implicitly solve the separable differential equation $y^{\prime}=\frac{x+1}{y+\cos y}$
4. Implicitly solve the separable differential equation $y^{\prime}=y(y+2)$. You will need partial fractions.
5. Explicitly solve the separable initial value problem $y^{\prime}=\frac{\cos t}{y^{2}}$ with $y\left(\frac{\pi}{2}\right)=2$.
6. Explicitly solve the separable initial value problem $y^{\prime}=\frac{t+1}{2 t y}$ with $y(1)=5$. Assume $t>0$.
