

Name: _____

Directions: Show all work. No credit for answers without work.

1. **[3 parts, 1 point each]** Classify each equation by giving the order and stating whether or not it is linear.

(a) $t^7 y'' - e^t y^5 = \sin(t)$

(b) $\cos(t) y y' = t$

(c) $\sin(t) y^{(3)} - \cos(t) y' = ty$

2. **[3 points]** Find the general solution to $y' + \cos(t)y = \cos(t)$.

3. [4 points] Solve the IVP explicitly: $y' = (e^{-x} + e^x)/(1 + y)$ with $y(0) = 1$.