Name	MUN Number

[10] 1. Show that

$$(5ty + 4y^2) + (t^2 + 2ty)\frac{dy}{dt} = 0$$

is not exact, but that it can be made exact. Find the solution.

[30]   2. Solve <u>THREE</u> of the following four equations, using an appropriate method studied in class. If you solve all four, only your best three will count towards your grade.

(a) $(t^2 - 3t + 2)\dfrac{dy}{dt} - ty = 0$, $\quad y(3) = 8$

(b) $t\dfrac{dy}{dt} - 3y = t^5 \cos(t)$

(c) $t^2\dfrac{dy}{dt} - ty - y^2 = t^2$

(d) $\dfrac{dy}{dt} + \dfrac{y}{\sqrt{t}} = \dfrac{y^3}{\sqrt{t}}$

[40]