Math3D - Practice Midterm

February 1, 2008

1. Find the general solution of $\frac{dy}{dt} + y\cos t = 0$.

2. Find the solution of the initial-value problem
$\frac{dy}{dt} - 2ty = t, \quad y(0) = 1.$

3. Solve the initial-value problem, and determine the interval of existence of the solution $\frac{dy}{dt} = \frac{2t}{y+yt^2}, \quad y(2) = 3.$

4. Solve the initial-value problem
$2t\cos y + 3t^2 y + (t^3 - t^2\sin y - y)\frac{dy}{dt} = 0, \quad y(0) = 2.$

5. Compute the first three picard iterates for the initial-value problem $y' = e^t + y^2, \quad y(0) = 0.$

6. Solve the initial-value problem
$5y'' + 5y' - y = 0; \quad y(0) = 0, \quad y'(0) = 1.$