

Homework #1
2013 Due Wednesday, Jan 30th in lecture

Math 527, UNH spring

Instructions:

1. Solve the following problems, simplifying the solution as much as you can.
2. AWE: Always Write Equations!
3. Your work should be organized and legible.
4. Use loose-leaf paper, not pages torn out from a spiral notebook.
5. Staple the pages together in the upper left-hand corner.
6. Write your name, section number, "Math 527", and "HW 1" in the upper-right corner of the first page.

Five percentage points will be deducted for each of instructions 4-6 not followed. Homeworks that are an effort to read will be returned ungraded.

Find the general solution of these separable ODEs. If an initial value is provided, also solve the initial value problem.

1. $\frac{dy}{dt} = 1 + t + y + yt$

2. $\frac{dy}{dx} = e^{3x+2y}$

3. $\frac{dy}{dt} = \frac{2t}{y + yt^2}, \quad y(2) = 3$

4. $\frac{dy}{dx} = \frac{3x^2 + 4x + 2}{2(y - 1)}, \quad y(0) = -1$

5. $\cos y \frac{dy}{dt} = -\frac{t}{1+t^2} \sin y, \quad y(1) = \pi/2$

Find the general solution of these 1st order linear ODEs.

6. $\frac{dy}{dt} + y \cos t = 0$

7. $\frac{dy}{dt} + y = te^t$

8. $x \frac{dy}{dx} + 4y = x^3 - x$

9. $x \frac{dy}{dx} + (1+x)y = e^{-x} \sin 2x$

10. $\cos^2 x \sin x \frac{dy}{dx} + y \cos^3 x = 1$