

Homework #3

Math 527, UNH spring 2015

Due Tuesday, February 10th in recitation

Instructions, same as usual: Solve the problems, simplifying the solution as much as you can. AWE: Always Write Equations, and ADTSTTBBSOTE: Always Do The Same Thing To Both Sides Of The Equation. Your work should be legible, organized, and written on loose-leaf paper. Staple the pages together in the upper left-hand corner. Write your name, "Math 527, section #" and "HW 3" in the upper-right corner.

Problems 1-7. Determine if the differential equation is exact. If it is exact, solve it.

1. $2x - 1 + (3y + 7)\frac{dy}{dx} = 0$

2. $2x + y - (x + 6y)\frac{dy}{dx} = 0$

3. $5x + 4y + (4x - 8y^3)\frac{dy}{dx} = 0$

4. $\sin y - y \sin x + (\cos x + x \cos y - y)\frac{dy}{dx} = 0$

5. $x^2 - y^2 + (x^2 - 2xy)\frac{dy}{dx} = 0$

6. $x^2y^3 - \frac{1}{1 + 9x^2} + x^3y^2\frac{dy}{dx} = 0$

7. $2y \sin x \cos x - y + 2y^2e^{xy^2} = (x - \sin^2 x - 4xye^{xy^2})\frac{dy}{dx}$

8. $t\frac{dy}{dt} = 2te^t - y + 6t^2$

Problems 9 and 10. Solve the initial-value problem.

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

9. $e^x + y + (2 + x + ye^y)\frac{dy}{dx} = 0, \quad y(0) = 1$

These problems are from Zill textbook exercises 2.4, sometimes in slightly different form.