

## MA530. Homework 2

*Homework due September 13, 2006*

1. Solve the initial value problem

(a) (#11 p.20)  $xy^2y' = y + 1; y(3e^2) = 2$

(b) (#15 p.27)  $y' + \frac{1}{x-2}y = 3x; y(3) = 4$

(c) (#13 p.34)  $3y^4 - 1 + 12xy^3y' = 0; y(1) = 2$

2. Find the general solution

(a) (#1 p.27)  $y' - \frac{3}{x}y = 2x^2$

(b) (#1 p.33)  $2y^2 + ye^{xy} + (4xy + xe^{xy} + 2y)y' = 0$

(c)  $2x \left(1 + \sqrt{x^2 - y}\right) dx - \sqrt{x^2 - y} dy = 0$

(d) (#3 p.46)  $y' + xy = xy^2$

(e) (#17 p.46)  $y' = \frac{3x-y-9}{x+y+1}$

(f)  $ydx - (x + x^2 + y^2)dy = 0$

Hint: an integrating factor  $\mu(x, y)$  is a function of  $x^2 + y^2$ :  $\mu(x, y) = f(x^2 + y^2)$