Worksheet 3 / 10 points

Name: .

Solve the following separable differential equation: $\dfrac{dy}{dx} = \dfrac{y(y-2)}{x}$

Solve the following DEs. If possible, put in the form $y = f(x)$. Give the domains where the solution is valid.

$$y^3 dx + \left(x^2\sqrt{x^2+y^2} - xy^2\right) dy = 0.$$

$$\frac{dy}{dx} = \frac{y^2}{x^2 + xy + y^2}$$

This problem requires a trick, which is basically lesson 8. The idea is to identify the obstruction to homogeneity and make a sneaky substitution.

$$(y - 2x + 1)dx + (2y + 6x - 3)dy = 0.$$