

## Homework 3

1. Solve the differential equations

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

2. Solve the differential equations

$$x \frac{dy}{dx} + y = \frac{1}{y^2}$$
$$t^2 \frac{dy}{dt} + y^2 = ty.$$

3. Solve the initial value problems

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