Department of mathematics and statistics
Differential Equations I
Compensating Course Exam 4.11.2014

Remark. Use of an abstract page of the size A4 is allowed to a candidate.

1. Solve implicitly the differential equation

$$4x^3 + y + (x + \cos y)\, y' = 0.$$

2. Solve the initial value problem

$$xy' + 2y = 1/x, \quad y(1) = 1.$$

Give also a maximal solution interval of it.

3. Solve the differential equation

$$y'' - y = e^x + 2.$$

4. Solve by an appropriate substitution the differential equation

$$y' = \frac{2x + y}{2} - 2 - \frac{1}{2(2x + y)}.$$