Name:

Instructor: Florin Rădulescu :

Section 000 Grade:

Sample Final 22M034 Sec 112

This is just a sample-The actual exam may look different

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Show all work, unsupported answers will receive no credit. No books
You **may** use your calculators and one handwritten page of formulae.

1. Find the integrating factor and solve

$$y' = e^{2x} + y - 1$$

2. (20 pt) Solve

$$(x^2 + 3xy + y^2)dx - x^2 dy = 0$$

3. (20 pt)
Solve

$$(x + e^y)dy - dx = 0.$$

4. (20 pt) Solve the equation

$$y'' + 1 = \cos t.$$

5. (20 pt)
Solve

$$y''' - 4y'' + 4y' = e^{2t}, y(0) = 1, y'(0) = 1.$$

Solve this equation by the method of variation of parameters. bf 6
Solve

$$y''' - 4y'' + 4y' = e^{2t}, y(0) = 1, y'(0) = 1.$$

Solve this equation by the method of identification of coefficients.
7
Solve

$$y''' - 4y'' + 4y' = e^{2t}, y(0) = 1, y'(0) = 1.$$

Solve this equation by the method of Laplace transform.
8 Solve

$$y''' - 4y'' + 4y' = e^{2t}, y(0) = 1, y'(0) = 1.$$

Solve this equation by the method of series centered at 0.
9 Solve the system

$$x_1' = 2x_1 + x_2 + x_3,$$

$$x_2' = x_1 + 2x_2 + x_3,$$

$$x_3' = x_1 + x_2 + 2x_3.$$