

Name: \_\_\_\_\_

Section: \_\_\_\_\_

R·I·T SCHOOL OF MATHEMATICAL SCIENCES

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## Homework 3

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MATH 211

1. Verify that  $y = \frac{1}{2}x^2e^x$  is a solution to the differential equation.

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

2. Find the general solution to the separable equation.

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

3. Solve the given initial value problem.

$$x^2 \frac{dy}{dx} = y - xy, y(-1) = -1$$

4. Solve the given initial value problem.

$$\sec^2 x \, dy + \csc y \, dx = 0, y\left(\frac{\pi}{4}\right) = 0$$