## MAT 235

# Ordinary Differential Equations 

Exam \# 2

Duration: 55 Minutes.

Name:
Section:
Instructor:
Grade:

1) (20 points) Use the method of undetermined coefficients to solve the following differential equation.

$$
y^{\prime \prime}-3 y^{\prime}+2 y=e^{x} \sin x
$$

2) (20 points) Solve the differential equation

$$
y^{\prime \prime}-4 y^{\prime}+4 y=\frac{e^{2 x}}{x+1}
$$

3) ( 25 points) Solve the initial value problem

$$
y^{\prime \prime}-\frac{6}{x^{2}} y=\frac{\ln x}{x^{2}} \text { for } x>0 \text { with } y(1)=\frac{1}{6}, y^{\prime}(1)=\frac{-1}{6}
$$

4) (35 points) Find the generalized power series solution in powers of $x$, of $x y^{\prime \prime}+(1-2 x) y^{\prime}-(1-x) y=0$.
