

# Math 3120-001: Practice Test three

November 15, 2011

*Professor Z. Sinkala*

Your Name:.....

---

## Problem 1

Find a general solution to the differential equation

$$y'' - y' - 2y = 0.$$

## Problem 2

Find a general solution to the following differential equations

(a)

$$y'' + 16y = 0.$$

(b)

$$y'' + 4y' + 4y = 0.$$

(c)

$$t^2y'' + 2ty' - 6y = 0.$$

### Problem 3

(a) Write the general form of particular solution of

$$y'' + 4y' + 4y = e^{-4t}.$$

(b) Find a particular solution of

$$y'' - 5y' + 4y = 8e^x.$$

---

## Problem 4

Find the general solution of the differential equation

$$y'' + 4y = 0.$$

## Problem 5

The function  $y_1 = t^2$  is a solution of

$$t^2 y'' - 3ty' + 4y = 0.$$

Find the general solution of the differential equation on the interval  $(0, \infty)$ .

## Problem 6

Which method can be used to solve the following differential equation

$$y'' - 3y' + 4y = \ln(t)?$$

- (a) Method of undetermined coefficient
- (b) Variation of parameters.

---

## Problem 7

Solve the the initial value problem

$$4y'' + 4y' + 17y = 0, \quad y(0) = -1, \quad y'(0) = 2.$$

---

## Problem 8

$$4t^2y'' + 8ty' + y = 0.$$

Find the general solution of the differential equation on the interval  $(0, \infty)$ .

---

## Problem 9

Solve

$$y'' + y = \sec(t).$$