

## Practice Exam 2, Math 214

1. Find the general solution to the following differential equations. You do not have to justify that your solution is the general solution.

(a)  $y'' - 6y' + 18y = 0$ .

(b)  $4y'' - 4y' + 3y = 0$ .

(c)  $y'' - 6y' + 18y = 3e^{3t}$ .

(d)  $y'' + y = \tan t$ .

2. (a) Find two constants  $n$  such that  $y = t^n$  is a solution to the differential equation

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

(b) Write down the general solution to the differential equation for  $t < 0$  and use the Wronskian to justify that this is the general solution.

3. Solve the initial value problem

$$y'' - 2y' + y = 3te^{2t}, \quad y(0) = 2 \quad y'(0) = 4.$$