Name:_____
M555: Differential Equations I (Spring 2018)
Instructor: Justin Ryan
Concept Check: Chapter 4

WICHITA STATE UNIVERSITY

Instructions *Complete these problems in groups. Be sure to show enough work.*

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1. Solve the fourth order differential equation.

$$y^{(4)} - y = 0$$

2. Show that the general solution of the equation in problem **1** may be written as

$$y(t) = c_1 \cos t + c_2 \sin t + c_3 \sinh t + c_4 \cosh t.$$

3. Determine the solution of the initial value problem (IVP)

$$\begin{cases} y^{(4)} - y = 0, \\ y(0) = 0, \\ y'(0) = 0, \\ y''(0) = 1, \\ y'''(0) = 1. \end{cases}$$

Why is it convenient to sue the solutions $\cosh t$ and $\sinh t$ rather than e^t and e^{-t}?

4. Find the general solution of the DE.

$$y''' - y' = t$$

5. Find the general solution of the DE.

$$\begin{cases} y''' - y'' + y' - y = \sec t, \\ -\frac{\pi}{2} < t < \frac{\pi}{2} \end{cases}$$