

## Reading

Sections 3.1, 3.2

1. Section 3.1, page 109, problem 8
2. Solve the initial value problem

$$\begin{aligned}y'' + 8y' - 9y &= 0 \\ y(0) = \alpha, y'(0) &= 1\end{aligned}$$

and find the value of  $\alpha$  so that  $\lim_{t \rightarrow \infty} y(t) = 0$

3. Find the equilibrium solutions of

$$3y'' + y' + 2y = 1$$

*Hint: if  $y(t)$  is an equilibrium solution, what can we say about  $y'$  and  $y''$ ?*

4. Section 3.2, page 119, problem 9
5. Show that  $y_1(t) = t, y_2(t) = te^t$  are a fundamental set of solutions for

$$t^2 y'' - t(t+2)y' + (t+2)y = 0$$

*Note: you will need to show that (a)  $y_1$  and  $y_2$  are solutions and (b) they form a fundamental set*

6. Given  $ty'' + 2y' + te^t y = 0$  has a fundamental set of solutions  $y_1$  and  $y_2$  and if  $W[y_1, y_2](1) = 3$ . Find the value of  $W[y_1, y_2](5)$