

**Homework 5: Due in class on Thursday 5/03**

1. Problem 4.12 on pp. 249 -250 of Vol. 2 of the text.
2. Problem 5.1 on pp. 283 -284 of Vol. 2 of the text.

*Note:* Before working on this problem, you need to read Section 5.1 of Vol. 2 of the text.

3. Consider Example 5.2.4 on pp. 268 -271 of Vol. 2 of the text. In the notation of that example,  $i = F(j)$  denotes the switching curve (see Fig. 5.2.6 on pg. 270). Think of this switching curve as depending on  $(\lambda, \mu_1, \mu_2)$ , and write it as  $F_{\nu, \mu_1, \mu_2}$ , where  $\nu$  denotes  $\lambda + \mu_1 + \mu_2$ .

Describe how  $F_{\nu, \mu_1, \mu_2}$  changes as  $\mu_2 \rightarrow \infty$  (for fixed  $\lambda$  and  $\mu_1$ ). Justify your claims both formally, to the extent possible, and intuitively.

*Note:* Before working on this problem, you need to read Section 5.1 and Example 5.2.4 of Vol. 2 of the text.

4. Problem 5.12 on pp. 277 of Vol. 1 of the text.

*Note:* You can work on this problem using the discussion in Section 8 of Chapter 7 of the book of Kumar and Varaiya.

5. Exercise (8.30) on pg. 127 of Section 8 of Chapter 7 of the book of Kumar and Varaiya.

*Note:* This exercise is on the corresponding handout, and in order to work on this exercise, it suffices to have read that handout.