

TOPIC 4: STATISTICAL PROCESS CONTROL

Practice Problems

1. If $\bar{R} = 4.0$ inches and the sample size = 20, compute the upper and lower limits for an R chart.
2. Professor I.M. Easy has had four quizzes so far this semester. She wants to create a control chart to determine if the variation in students' scores from quiz to quiz is exhibiting only natural variation. (In other words, do the quizzes have about the same level of difficulty?). She chooses three students from each quiz, whose quiz scores are shown below.

<u>Quiz</u>	<u>Student</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
1	75	100	50
2	72	92	82
3	90	90	90
4	60	96	60

- a. What are the upper and lower control limits for the $\bar{x}$ -bar chart?
 - b. Based on the $\bar{x}$ -bar chart, is the process in control?
3. For 20 straight days, 120 automotive pistons are inspected and the number of defective pistons per sample is shown below.

<u>Sample</u>	<u>Defects</u>	<u>Sample</u>	<u>Defects</u>
1	11	11	11
2	2	12	2
3	10	13	22
4	0	14	7
5	30	15	15
6	1	16	13
7	12	17	4
8	11	18	3
9	6	19	9
10	7	20	8

- a. What are the upper and lower control limits for the p -chart?
 - b. Is the process in control?
4. The Colorado Cable Company randomly inspects samples from the cable it produces. The historical average number of defects is 3 per 10,000 feet of cable. Compute the upper and lower control limits.
 5. Red Top Cab Company receives several complaints per day about the behavior of its drivers. Over a 10-day period (where days are the unit of measure), the owner received the following numbers of calls from irate passengers: 8, 0, 6, 4, 5, 10, 5, 7, 8, 6. Calculate the upper and lower control limits for the c -chart.