

STAT 312/312 R

Quiz-1: 16 points

1. Disks of polycarbonate plastic from a supplier are analyzed for scratch and shock resistance. The results from 100 disks are summarized as follows:

		Shock Resistance	
		High	Low
Scratch Resistance	High	70	9
	Low	16	5

Let A denote the event that a disk has high shock resistance, and let B denote the event that a disk has high scratch resistance. If a disk is selected at random, determine the following probabilities: (6 points)

- $P(A)$
 - $P(B)$
 - $P(A^c)$
 - $P(A \cap B)$
 - $P(A \cup B)$
 - $P(A^c \cup B)$
2. Suppose that a certain company sends 40% of its overnight mail parcels by service S1, 50% of its overnight mail parcels by service S2, and 10% of its overnight mail parcels by service S3. 98% of those sent by S1 arrive on time, 99% of those sent by S2 arrive on time, 95% of those sent by S3 arrive on time. A parcel is selected at random from the list of those sent one night.
- What is the probability that it arrives on time? (4 points)
 - Given that it arrives on time, what is the probability that it was sent by service S1?(3 points)
 - Given that it arrives late, what is the probability that it was sent by service S1? (3 points)

Show all the steps to receive full credit. No credit will be given for just reporting the final answer.