

Poisson and Binomial practice problems

1. Customers arrive at a checkout counter in a department store according to a Poisson distribution at an average of 7 per hour.

a. Probability that exactly five customers arrive in the next hour?

b. Probability that no more than three customers arrive in the next hour?

c. Probability that at least two customers arrive in the next hour?

2. A random sample of 20 gadgets from a production line during an hour are tested. When the plant is functioning normally about 1% of gadgets fail the test. A large number of failures is evidence that something is wrong. The question is, what is a large number? To get a sense of how many failures might be worrisome, fill in the table below, where the random variable X is how many gadgets failed out of the 20 tested.

j	0	1	2	3	4
$P(X=j)$					

3. A salesperson has found that the probability of a sale on a single contact is approximately 0.03. If the salesperson contacts 100 prospects, what is the probability of making at least one sale? Calculate in two ways: **exactly** (clearly stating the distribution you use) and **approximately** (again clearly specify what distribution you use).