

## Math 342 —Poisson distribution

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

- a. Find the probability
  1. exactly five customers arrive in the next hour
  2. no more than three customers arrive in the next hour
  3. at least two customers arrive in the next hour
- b. Answer the same questions but change “next hour” to “next 30 minutes.”

**Problem 2.** A telemarketing company has found that the probability of making a sale when calling someone on the telephone is approximately 0.0002. If the salesperson contacts 10000 prospects, what is the probability of making between 2 and 5 sales?

- a. Calculate this using the binomial distribution. What are  $n$  and  $p$ ?
- b. Let  $Y \sim \text{Pois}(np)$ . Compute  $P(2 \leq Y \leq 5)$  and compare with your previous answer.