

Ch. 16 Probability Models Practice #1

Directions: Read carefully. Use proper notation, and write each answer as a simplified fraction, decimal, and percent. Round to the nearest hundredth and nearest percent.

1) What is the difference between geometric and binomial probability models?

2) List the conditions of Bernoulli Trials.

3) Bernoulli Trials: Geometric, Binomial, or Neither? Justify your answer with conditions and definitions.

a) Blood type is inherited. If both parents carry genes for the O and A blood types, each child has probability 0.25 of getting two O genes and so of having blood type O. Different children inherit independently of each other. We wish to find the probability that the first child these parents have with type O blood is their third child.

b) You want to know what percent of married people believe that mothers of young children should not be employed outside their home. You plan to interview 50 people, and for the sake of convenience you decide to interview both the husband and wife in 25 married couples. The random variable X is the number among the 50 persons interviewed who think mothers should not be employed.

4) Geometric Probability Models (pdf= 1 outcome and cdf=sum of multiple outcomes)

a) Among employed women, 25% have never been married. Suppose we randomly sample women in a particular business office. What is the probability that the first woman who says she has never been married is the fourth woman we sample?

b) What is the probability that you sample 5 women before finding one who has never been married?

c) Among employed women, 25% have never been married. What is the probability that we find the first never-married woman within the first 5 we sample?

d) Among employed women, 25% have never been married. What is the probability that we sample at most 2 women before finding one who has never been married?

5) Binomial Probability Models (pdf = individual outcome and cdf = sum of x or fewer successes by n trials)

a) A basketball player has a 60% chance of making each free throw. What is the probability that the player makes exactly three out of six free throws?

b) A class has five students. What is the probability that exactly two of the students were born on a weekend?

c) The probability the Tim will sink a foul shot is 70%. If Tim attempts 30 foul shots, what is the probability that he sinks at most 21 shots?

d) A pair of dice is rolled 20 times. What is the probability that a sum of 5 is rolled up to 5 times?