

This quiz covers material from section 8.4.

1. (*2 points*) In each of the following situations, the random variable X is modeled by a Binomial Distribution. Write the corresponding values of n , p , and q . **Do not calculate the probability.**

a. (*1 pt*) From experience, the manager of Kramer's Book Mart knows that 20% of the people who are browsing in the store will make a purchase. What is the probability that among twenty people who are browsing in the store, at least ten will make a purchase?

$n =$ _____ $p =$ _____ $q =$ _____

b. (*1 pt*) An urn contains six red marbles and three blue marbles. A marble is selected at random, replaced, and then another marble is selected. This happens a total of four times. What is the probability that two red marbles are selected?

$n =$ _____ $p =$ _____ $q =$ _____

2. (*2 points*) Three out of every ten high school students fail their driving test on the first try. A group of four friends all take the driving test on the same day. What is the probability that exactly two of them pass?

3. (3 points) In genetics, traits are represented by dominant (A) and recessive (a) genes. When two people have a child, and the parents have both dominant and recessive genes (Aa), the child has a $\frac{1}{4}$ chance of having the recessive trait, and a $\frac{3}{4}$ chance of having the dominant trait. The table below gives some traits and their dominant and recessive expressions. Assume traits are independently passed onto the child.

trait	dominant	recessive
eye color	brown	blue
hair	straight	curly
connected ear lobe	no	yes
webbed toes	no	yes

a. (1 pt) What is the probability the child has the recessive trait for exactly three of these characteristics?

b. (1 pt) What is the probability the child has the dominant trait for exactly two of these characteristics?

c. (1 pt) What is the probability the child has straight hair and connected ear lobes? (Careful! Ask yourself if this is a binomial distribution)

4. (3 points) A new drug cures narcolepsy in 80% of rats. To test this, a researcher administers the drug to ten rats. Assuming the drug works as advertised, what is the probability it cures less than 8 of the rats (i.e., does not verify the claim that it works on 80% of the rats)?