**1)** A customer randomly selects two RAM modules from a shipment of six known to contain two defective modules.

**a)** Create the probability distribution for $x$, the number of defective modules in the purchase.
**b)** Compute the expected number of defective RAM modules the customer would purchase.

**2)** A drawer contains four red socks and two blue socks. Three socks are drawn from the drawer without replacement.

**a)** Create a probability distribution in which the random variable represents the number of red socks.
**b)** Determine the expected number of red socks if three are drawn from the drawer without replacement.

**3)** There are five cats and seven dogs in a pet shop. Four pets are chosen at random for a visit to a children's hospital.

**a)** Create a probability distribution for the number of dogs chosen for a random visit to the hospital.
**b)** What is the probability that at least one dog is chosen to go?
**c)** What is the expected number of dogs chosen?

**4)** A 12---member jury for a criminal case will be selected from a pool of 14 men and 11 women.

**a)** What is the probability that the jury will have an equal number of men and women?
**b)** What is the probability that at least 3 jurors will be women?
**c)** What is the expected number of women? *(Note: the formula $E(x) = r\left(\frac{a}{n}\right)$ can be used for hypergeometric distributions)*

**5)** The door prizes at a dance are four $10 gift certificates, five $20 gift certificates, and three $50 gift certificates. The prize envelopes are mixed together in a bag, and five prizes are drawn at random.

**a)** Create a probability distribution for the number of $10 gift certificates drawn.
**b)** What is the expected number of $10 gift certificates drawn?