

examples:

1. Calculate the following probabilities

- a) A card is drawn from a standard 52-card deck and its suit is noted. The card is returned to the deck and the deck is reshuffled. This is done 10 times. FTPT 5 of the cards will be hearts.
  - b) A bag contains 12 red marbles and 6 green marbles. A marble is drawn from the bag, its colour is noted and it is returned to the bag. What is the prob of the marble being red on 6 draws in a row?
  - c) A test consists of 20 multiple choice questions, each with 5 possible responses. If you guess randomly on each question, FTPT you guess 4 correct answers.
  - d) In a soft-drink bottling plant, 90% of the 250mL bottles contain more than 240mL of pop. 6 bottles are chosen at random to make up a case. FTPT none will contain 240mL or less.
2. A baseball player has a batting average of 0.300. Assume that this indicates that each time he comes to bat, there is a 30% chance he will make a safe hit. In each game the player comes to bat 6 times
- a) What are the possible # of safe hits the player might have in this game?
  - b) Let  $B$  be the binomial random variable which maps each possible game for the batter to the # of safe hits made in the game. List the probability distribution for the random variable  $B$ .
  - c) Which value of  $B$  (# of safe hits) in the distribution has the greatest probability?

3. Quality control testing indicates that 3 out of every 20 bags of Munch Crunch Junk Food contains less than 300g of Munch Crunch. 12 bags are chosen at random FTPT
- all of the bags contain 300g or more
  - more than two bags will have less than 300g
4. A committee consists of 12 women and 8 men. A sub-committee of 5 people is selected at random from the committee.  $X$  is the random variable which maps each possible sub-committee to the # of women on the committee.
- Find  $P(X=0)$
  - What is the probability that there will be at most one man on the sub-committee?
5. In a bag there are 20 white marbles and 30 black marbles. Four marbles are randomly selected at the same time. FTPT exactly 3 of the marbles selected are black.
6. Going into a football game, a field goal kicker had been successful on 28 out of 35 field goal attempts. During the game, the player successfully kicked 5 of 5 field goals attempted. Based on his performance before the game, FTPT he was successful on all 5 kicks in this game.
7. A candy store operator finds that  $\frac{5}{8}$  of the # of people who come into his store make a purchase. In a particular hour 48 people came into the store. FTPT exactly half of the people made a purchase.