

4. A single card is selected at random from a regular deck of 52 cards. (22 points)
- a. Find $P(\text{the card is a face card}^1)$

 - b. Find $P(\text{the card is not a face card})$

 - c. Find $P(\text{the card is a heart})$

 - d. Find $P(\text{the card is a heart and the card is a face card})$

 - e. Find $P(\text{the card is a heart or the card is a face card})$

¹ Note: Face cards are Kings, Queens, and Jacks.

5. The probability that a person owns a microwave oven is 0.75, that a person owns a compact disk player is 0.35, and that a person owns both a microwave and a CD player is 0.16. Find the probability that a person owns either a microwave or a CD player. (8 points)

6. If a die is rolled eleven times, find the probability of getting at least one '3'. (8 points)

7. Complete each formula below for n distinct items taken r at a time. (8 points)

a. ${}_n P_r =$

b. ${}_n C_r =$

8. A person randomly selects three marbles (without replacement) from a jar containing 6 red marbles, 2 white marbles, and 7 blue marbles. Find the probability of selecting: (20 points)

a. all blue marbles

b. two red marbles and one blue marble

c. both white marbles and one of a different color

d. one marble of each color

9. A manufacturer makes two types of mp3 player: an expensive model that accounts for 25% of their unit sales and a cheaper model that accounts for the other 75% of their unit sales. Twenty percent of the expensive model are colored pink, and ten percent of the cheaper model are colored pink. If an mp3 player made by this company is randomly selected, what is the probability that it is pink? (10 points)

Formulas

$$P(A \text{ or } B) = P(A) + P(B)$$

$$P(E) + P(\bar{E}) = 1$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(E) = \frac{n(E)}{n(S)}$$

$$P(\bar{E}) = 1 - P(E)$$

$$P(B | A) = \frac{P(A \text{ and } B)}{P(A)}$$

$$P(A \text{ and } B) = P(A) \cdot P(B | A)$$

$$P(\bar{E}) = 1 - P(E)$$

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

Scratch Paper

Work on this page will not be graded under any circumstances!