

MATH 210 FINITE MATHEMATICS

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7.6 Bayes' Theorem

Idea: IF we are given information about $P(E|F)$, what can we say about $P(F|E)$?

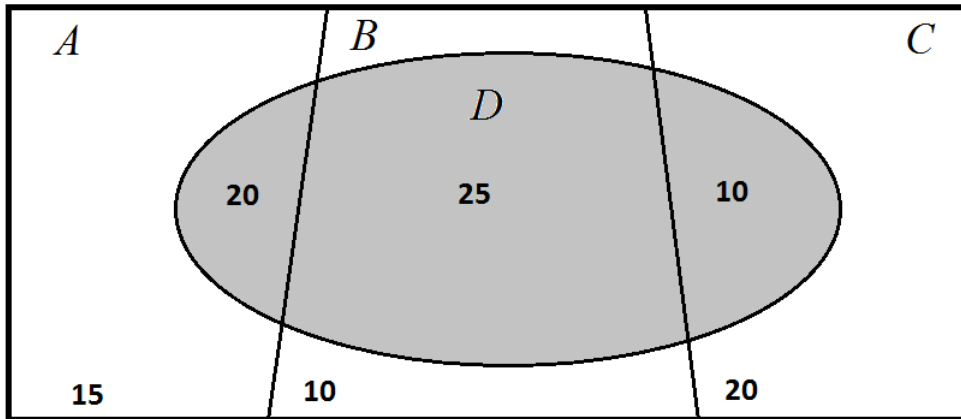
Theorem 1: Bayes' Theorem

1. Let S be a sample space partitioned into n events, A_1, A_2, \dots, A_n .
2. Let E be an event in S

The probability of A_i , given E has occurred

Example 1

Refer to the venn diagram. Use it to answer the following questions



1. $P(D)$

3. $P(D^c)$

2. $P(A|D)$

4. $P(B|D^c)$

Draw a tree diagram

Example 2

210 M&Ms are in a bag (140 green, 70 blue). I currently have in my lunchbox 12 green and 4 blue. A M&M is drawn at random from the bag and placed in my lunch box. During lunch I randomly select a blue M&M. What is the probability the transferred M&M from the bag was green?

Example 3: Use class survey from 7.5

In a survey of _____ students, it was found that _____ were female. Additionally, it was found that _____% of those females play games, whereas _____% of the males play games. Find the probability a randomly selected student

1. is female given they play games?