



Skill: Conditional Probability and Venn Diagrams

What Is Conditional Probability?

Notation:

$P(A|B)$ means

Formula:

Example 1

A group of 100 people produced the following information relating to three attributes. The attributes were wearing glasses, being left handed and having dark hair. Glasses were worn by 36 people, 28 were left handed and 36 had dark hair. There were 17 who wore glasses and were left handed, 19 who wore glasses and had dark hair and 15 who were left handed and had dark hair. Only 10 people wore glasses, were left handed and had dark hair.

Use 'G' to denote the event that a chosen person wears glasses, 'LH' to denote the event that a person is left handed and 'DH' to denote the event that a person has dark hair.

- i. Draw a Venn diagram to represent this information.



ii. State in words what the following expressions represent and determine the corresponding probabilities:

a. $P(G|DH)$

b. $P(DH|G)$

c. $P(LH|G')$

d. $P(G|LH \text{ or } DH)$



Example 2

Reminder:

Independent Events

Mutually Exclusive Events

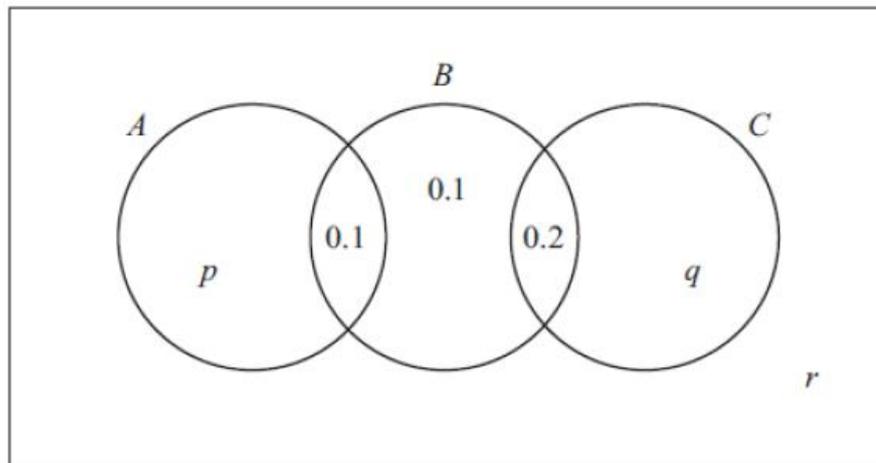


Figure 1

The Venn diagram in Figure 1 shows three events A , B and C and the probabilities associated with each region of B . The constants p , q and r each represent probabilities associated with the three separate regions outside B .

The events A and B are independent.

(a) Find the value of p .

(3)



Given that $P(B|C) = \frac{5}{11}$

(b) find the value of q and the value of r .

(4)

(c) Find $P(A \cup C|B)$.

(2)