



# Conditional Probability



1. Two events,  $A$  and  $B$ , are such that  $P(A \cap B) = 0.5$  and  $P(B) = 0.75$ . Find  $P(A|B)$ .
2. If  $P(A) = \frac{1}{2}$  and  $P(B) = \frac{5}{12}$  and  $P(A \cup B) = \frac{3}{4}$ .  
Find  $P(A|B)$  and  $P(B|A)$
3. In an all boys school, 40% of the students play rugby. 15% of the students play both rugby and hurling. If a student from the school is selected at random, what is the probability that he plays hurling, given that he plays rugby.
4. In a class of 30 students, 19 of the students study French. 15 of the students study Business and 3 of the students study neither French nor Business.
  - i. Using a Venn Diagram, find how many of the students study both French and Business.
  - ii. What is the probability that a student studies either French or Business?
  - iii. What is the probability that a student studies Business, given that they study French?
5.  $P(E) = \frac{7}{12}$   $P(F) = \frac{1}{2}$   $P(E \cup F) = \frac{7}{8}$   
Find:
  - i.  $P(E \cap F)$
  - ii.  $P(E|F)$
  - iii.  $P(E'|F)$
  - iv.  $P(E|F')$
  - v.  $P(F|E')$
6.  $A$  and  $B$  are two events such that  $P(A) = 0.48$ ,  $P(B) = 0.36$ , and  $P(A|B) = 0.5$   
Find:
  - i.  $P(A \cap B)$
  - ii.  $P(A \cup B)$
  - iii.  $P(B|A)$
7. If  $P(A) = \frac{1}{2}$ ,  $P(A|B) = \frac{2}{5}$  and  $P(A \cup B) = \frac{3}{4}$ , find  $P(A \cap B)$  and  $P(B)$ .
8. In a school, 55% of the students are girls and 45% are boys. 35% of the girls play sports and 60% of the boys play sports. A student is picked random, what is the probability that this student is a girl, given that they play sports?





9. In a certain county in Ireland, 60% of people are aged 35 years or more, and 40% of people are under 35 years old. In the General election, 34% of the 35 and over group voted for Fine Gael, 30% of the 35 and over group voted for Fianna Fail, and the rest of the 35 and over group voted for another party. Regarding the under 35 group, 42% of them voted for Fine Gael, 26% for Fianna Fail and the rest voted for another party. If a person is selected at random, what is the probability that person is over 35, given that they voted for Fine Gael.
10. You meet a man who tells you he has 3 children. He also tells you that two of his children are boys. What is the probability that the other child is a girl?

Leamy Maths Community

