

Prob laws with tree dia

41 min
53 marks

1. For events A and B , the probabilities are $P(A) = \frac{4}{13}$ and $P(B) = \frac{5}{13}$.

(a) If events A and B are mutually exclusive, write down the value of $P(A \cap B)$.

(1)

(b) If events A and B are independent, find the value of $P(A \cap B)$.

(2)

(c) If $P(A \cup B) = \frac{7}{13}$, find the value of $P(A \cap B)$.

(3)

(Total 6 marks)

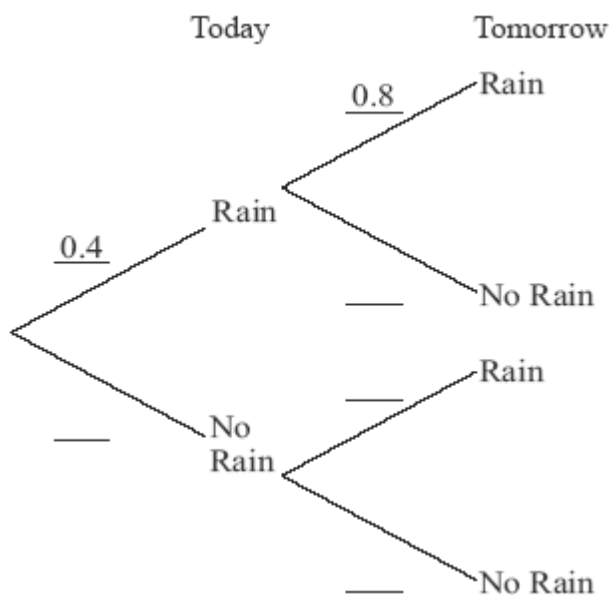
2. Events A and B have probabilities $P(A) = 0.4$, $P(B) = 0.65$, and $P(A \cup B) = 0.85$.

- (a) Calculate $P(A \cap B)$.
- (b) State with a reason whether events A and B are independent.
- (c) State with a reason whether events A and B are mutually exclusive.

(Total 6 marks)

3. The probability that it rains today is 0.4. If it rains today, the probability that it will rain tomorrow is 0.8. If it does not rain today, the probability that it will rain tomorrow is 0.7.

- (a) Complete the tree diagram below.



(3)

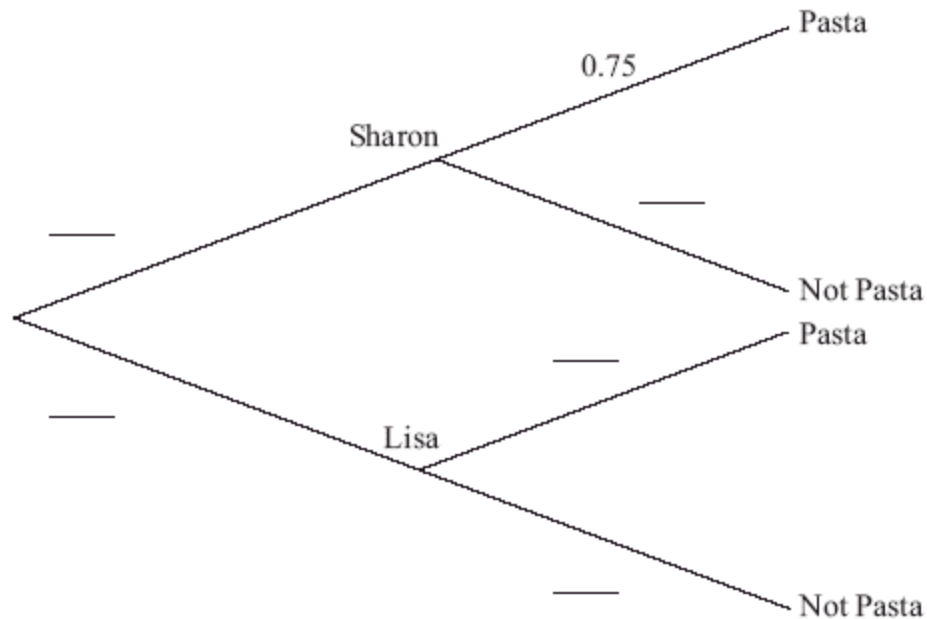
- (b) Calculate the probability of rain tomorrow.

(3)

(Total 6 marks)

4. Sharon and Lisa share a flat. Sharon cooks dinner three nights out of ten. If Sharon does not cook dinner, then Lisa does. If Sharon cooks dinner the probability that they have pasta is 0.75. If Lisa cooks dinner the probability that they have pasta is 0.12.

(a) **Copy and complete** the tree diagram to represent this information.



(3)

(b) Find the probability that Lisa cooks dinner and they do not have pasta.

(2)

(c) Find the probability that they do not have pasta.

(3)

(d) Given that they do not have pasta, find the probability that Lisa cooked dinner.

(3)

(Total 11 marks)

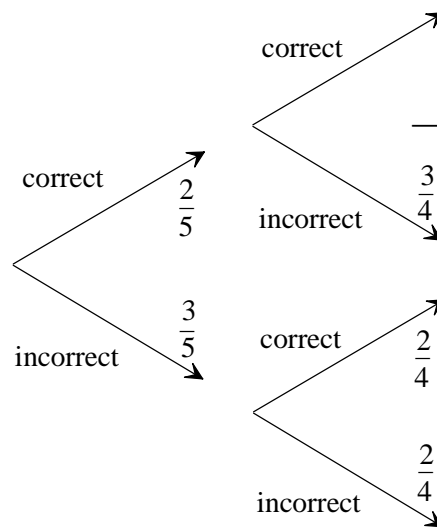
5. Heinrich rolls two 6-sided dice at the same time. One die has three red sides and three black sides. The other die has the sides numbered from 1 to 6. By means of a tree diagram, table of outcomes or otherwise, answer each of the following questions.

(a) How many different possible combinations can he roll?

- (b) What is the probability that he will roll a red and an even number?
- (c) What is the probability that he will roll a red or black and a 5?
- (d) What is the probability that he will roll a number less than 3?

(Total 8 marks)

6. Sandra is attempting an exam question. She has to choose two correct statements from a list of five. Below is a tree diagram showing Sandra's possible choices. One of the probability values is missing.

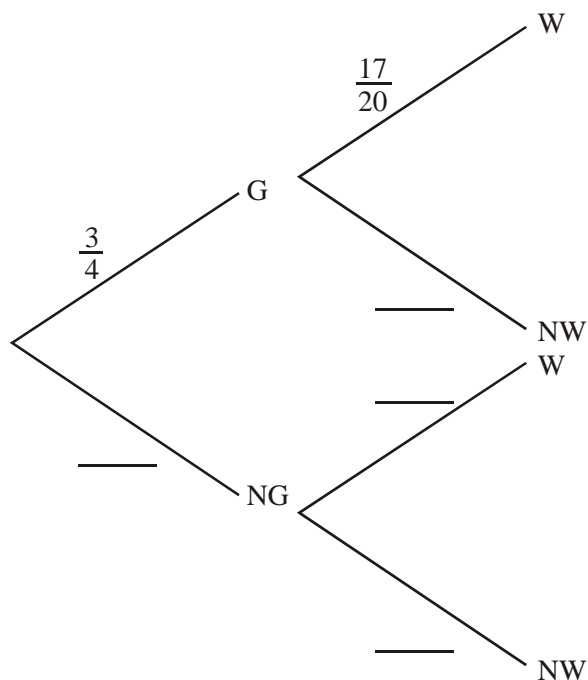


- (a) Fill in the missing probability value on the diagram.
- (b) (i) If Sandra makes two guesses, what is the probability that she will get only one of them correct?
- (ii) Sandra definitely knows the first correct statement but has to guess the second. What is the probability that she will answer both correctly?

(Total 8 marks)

7. Today Philip intends to go walking. The probability of good weather (G) is $\frac{3}{4}$. If the weather is good, the probability he will go walking (W) is $\frac{17}{20}$. If the weather forecast is not good (NG) the probability he will go walking is $\frac{1}{5}$.

(a) Complete the probability tree diagram to illustrate this information.



(b) What is the probability that Philip will go walking?

(Total 8 marks)