

Questions on Conditional Probability

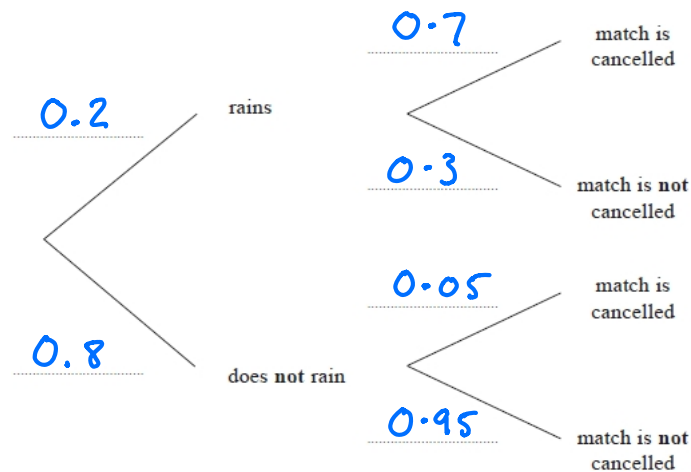
Q1.

The probability that it will rain on a day in June is 0.2

When it rains the probability that my tennis match is cancelled is 0.7

When it does **not** rain, the probability that my tennis match is **not** cancelled is 0.95

(a) Complete the probability tree diagram for this information.



(3)

(b) Work out the probability that, on a day in June, it does **not** rain and my tennis match is cancelled.

$$\begin{aligned} 0.8 \times 0.05 \\ = 0.04 \end{aligned}$$

0.04

(2)

(Total for question = 5 marks)

Q2.

There are 8 counters in a box.

The letter A is on 6 of the counters.

The letter B is on the other 2 counters.

Sally takes at random a counter from the box.

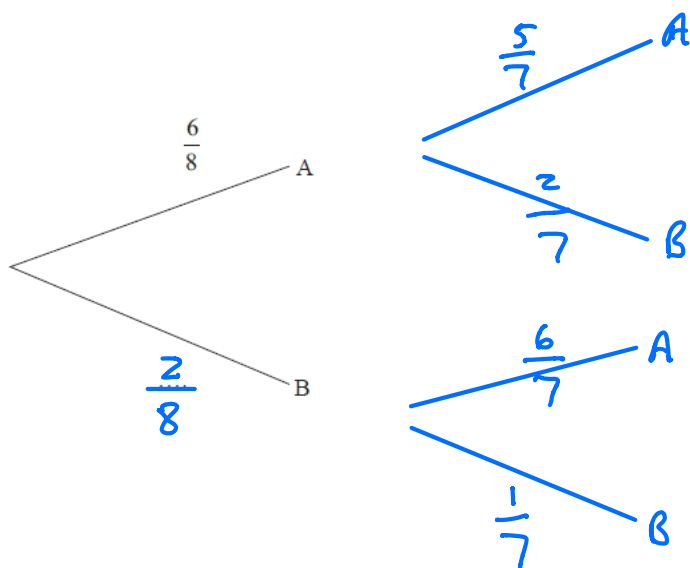
She keeps the counter.

Then Tina takes at random a counter from the box.

(a) Complete the probability tree diagram.

Sally

Tina



(3)

(b) Work out the probability that both Sally and Tina take a counter with the letter A on it.

$$\frac{6}{8} \times \frac{5}{7} = \frac{30}{56} \quad \text{or} \quad \frac{15}{28}$$

(2)

(c) Work out the probability that at least one counter with the letter A on it is taken.

$$\begin{aligned}
 & 1 - P(BB) && \text{or } \frac{6}{8} \times \frac{5}{7} + \frac{6}{8} \times \frac{2}{7} + \frac{2}{8} \times \frac{6}{7} \\
 = & 1 - \frac{2}{8} \times \frac{1}{7} && = \frac{30}{56} + \frac{12}{56} + \frac{12}{56} = \frac{54}{56} && \frac{27}{28} \\
 = & 1 - \frac{2}{56} && \\
 = & \frac{54}{56} \quad \text{or} \quad \frac{27}{28}
 \end{aligned}$$

(3)

(Total for question = 8 marks)

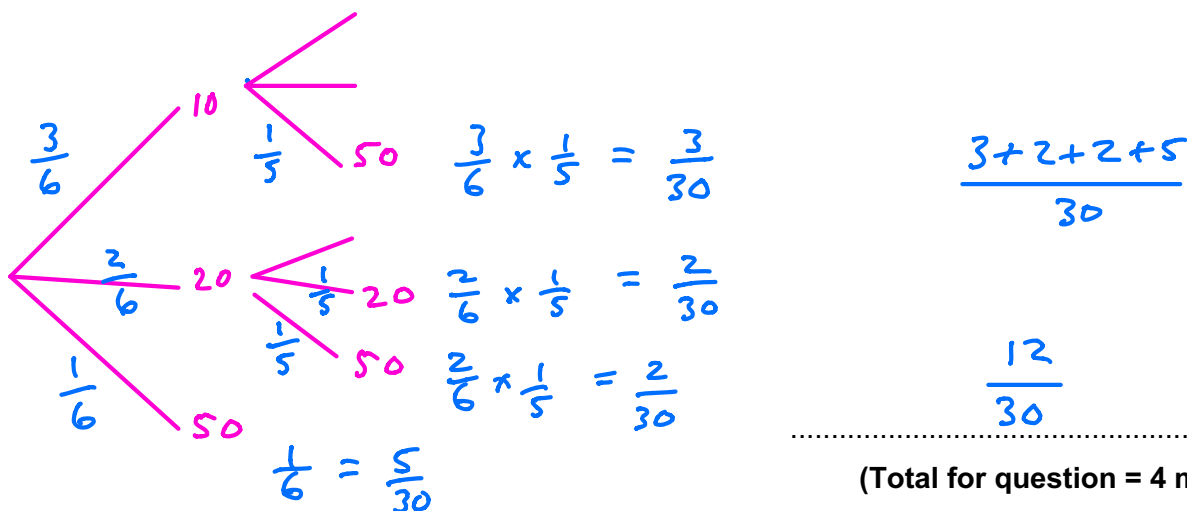
Q3.

These 6 coins are in a box.

10p	10p	10p	20p	20p	50p
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Pritesh takes at random 2 coins from the box.

Work out the probability that the total value of the 2 coins is at least 40p.



(Total for question = 4 marks)

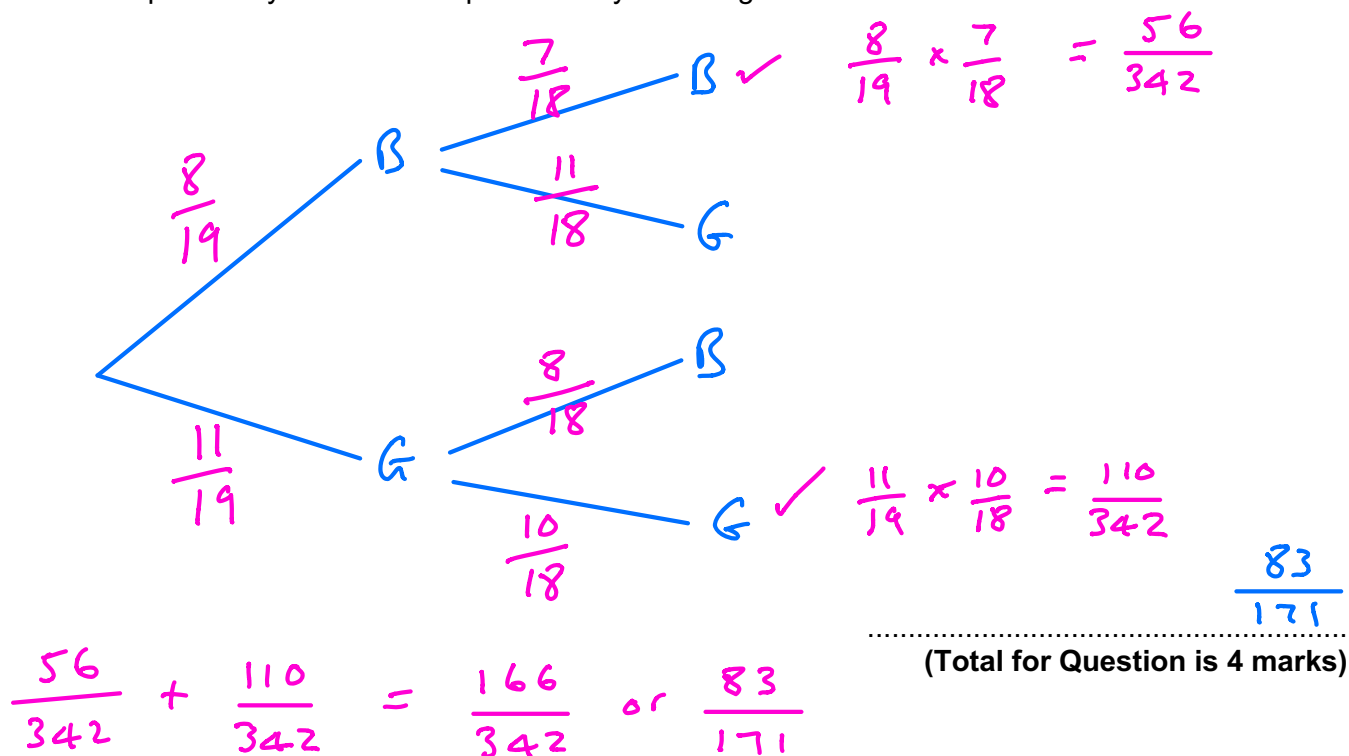
Q4.

There are 11 girls and 8 boys in a tennis club.

Jake is going to pick at random a team from the tennis club.

The team will have two players.

Work out the probability that Jake will pick two boys or two girls for the team.



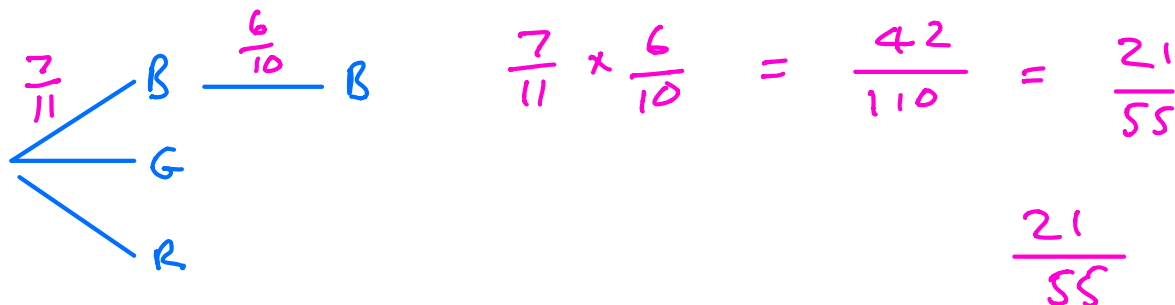
(Total for Question is 4 marks)

Q5.

There are 7 blue counters, 3 green counters and 1 red counter in a bag.
There are no other counters in the bag.

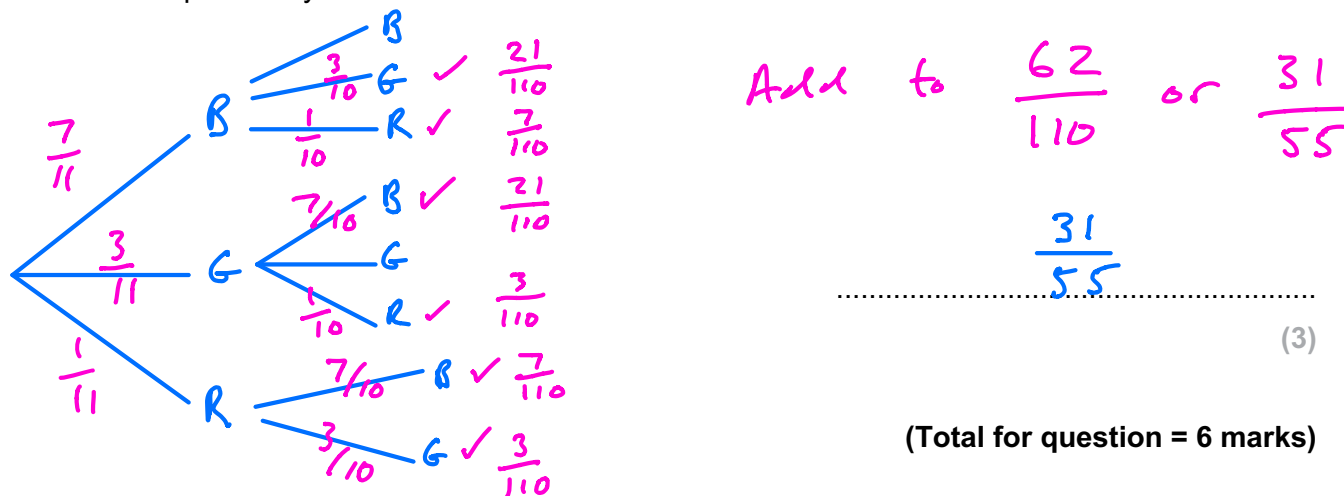
Hubert takes at random 2 counters from the bag.

(a) Work out the probability that both counters are blue.



(3)

(b) Work out the probability that the 2 counters are different colours.

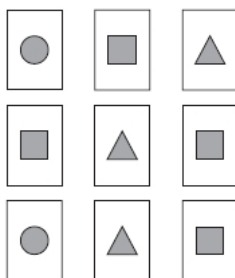


(3)

(Total for question = 6 marks)

Q6.

Here are 9 cards.
Each card has a shape on it.

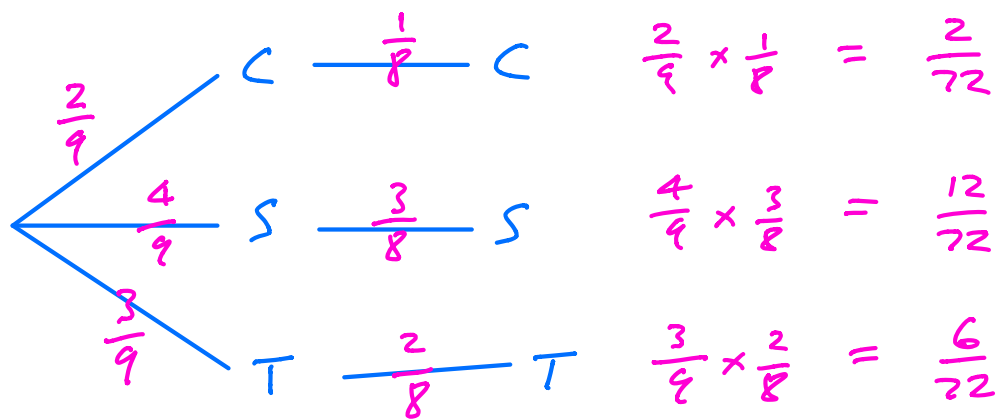


Circles 2
Squares 4
Triangles 3

In a game the cards are turned over so that the shapes are hidden.
The cards are then mixed up.

Katie turns over at random two of the cards.

Work out the probability that these two cards have different shapes on them.
You must show all your working.



$$P(\text{Both the same}) = \frac{2}{72} + \frac{12}{72} + \frac{6}{72} = \frac{20}{72}$$

$$P(\text{Different}) = 1 - P(\text{Same})$$

$$= 1 - \frac{20}{72} = \frac{52}{72}$$

$$\frac{52}{72} \quad \text{or} \quad \frac{13}{18}$$

(Total for question = 4 marks)

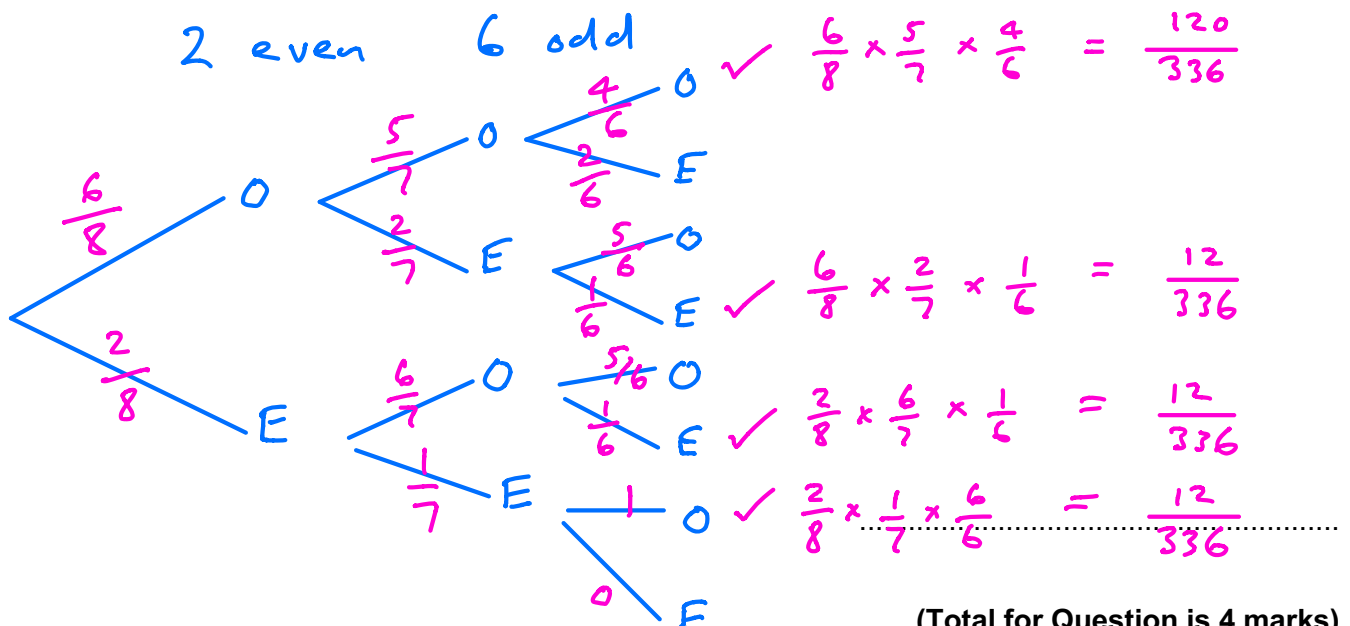
Q7.

Paul has 8 cards.
There is a number on each card.



Paul takes at random 3 of the cards.
He adds together the 3 numbers on the cards to get a total T .

Work out the probability that T is an odd number.



(Total for Question is 4 marks)

Answer $\frac{156}{336}$ or $\frac{13}{28}$

Q8.

There are 12 counters in a bag.

There is an equal number of red counters, blue counters and yellow counters in the bag.

There are no other counters in the bag.

4 of each

3 counters are taken at random from the bag.

(a) Work out the probability of taking 3 red counters.

$$\frac{4}{12} \times \frac{3}{11} \times \frac{2}{10} = \frac{24}{1320} = \frac{1}{55}$$

$$\frac{1}{55}$$

(2)

The 3 counters are put back into the bag.

Some more counters are now put into the bag.

There is still an equal number of red counters, blue counters and yellow counters in the bag.

There are no counters of any other colour in the bag.

3 counters are taken at random from the bag.

(b) Is it now less likely or equally likely or more likely that the 3 counters will be red?

You must show how you get your answer.

More likely as successive probabilities
in the calculation decrease less when there
are more counters

$$\text{Eg } \frac{1}{55} = 0.018$$

$$\frac{33}{99} \times \frac{32}{98} \times \frac{31}{97} = 0.035$$

(2)

(Total for question = 4 marks)

Q9.

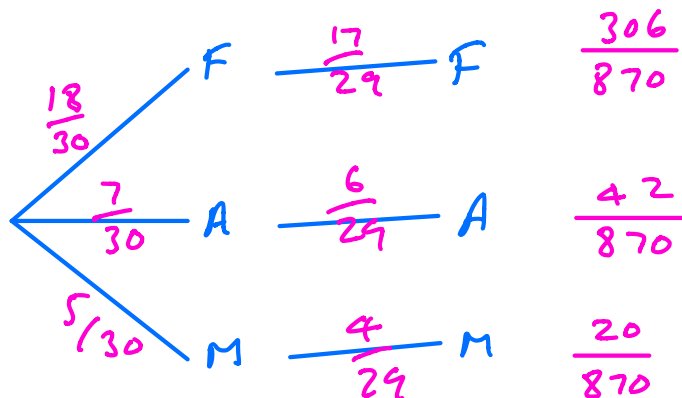
Nomusa has 30 sweets.

She has

- 18 fruit sweets
- 7 aniseed sweets
- 5 mint sweets

Nomusa is going to take at random two sweets.

Work out the probability that the two sweets will **not** be the same type of sweet.
You must show all your working.



$$P(\text{Same}) = \frac{368}{870}$$

$$P(\text{Diff}) = 1 - \frac{368}{870}$$

$$= \frac{502}{870}$$

$$= \frac{251}{435}$$

(Total for question = 4 marks)

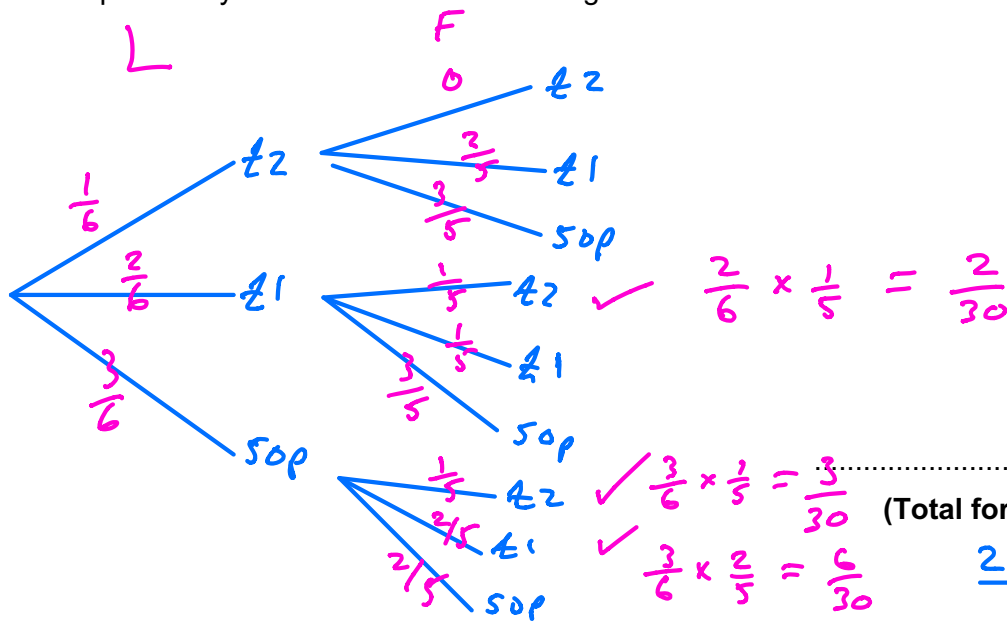
Q10.

There are six coins in a bag.
The value of each coin is shown below.

£2 £1 £1 50p 50p 50p

Laura takes at random a coin from the bag and keeps it.
Fahmida then takes at random a coin from the bag and keeps it.

Calculate the probability that Fahmida's coin has a greater value than Laura's coin.



(Total for question = 3 marks)

$$\frac{2+3+6}{30} = \frac{11}{30}$$