

1. Nov/2023/Paper_9709/52/No.6

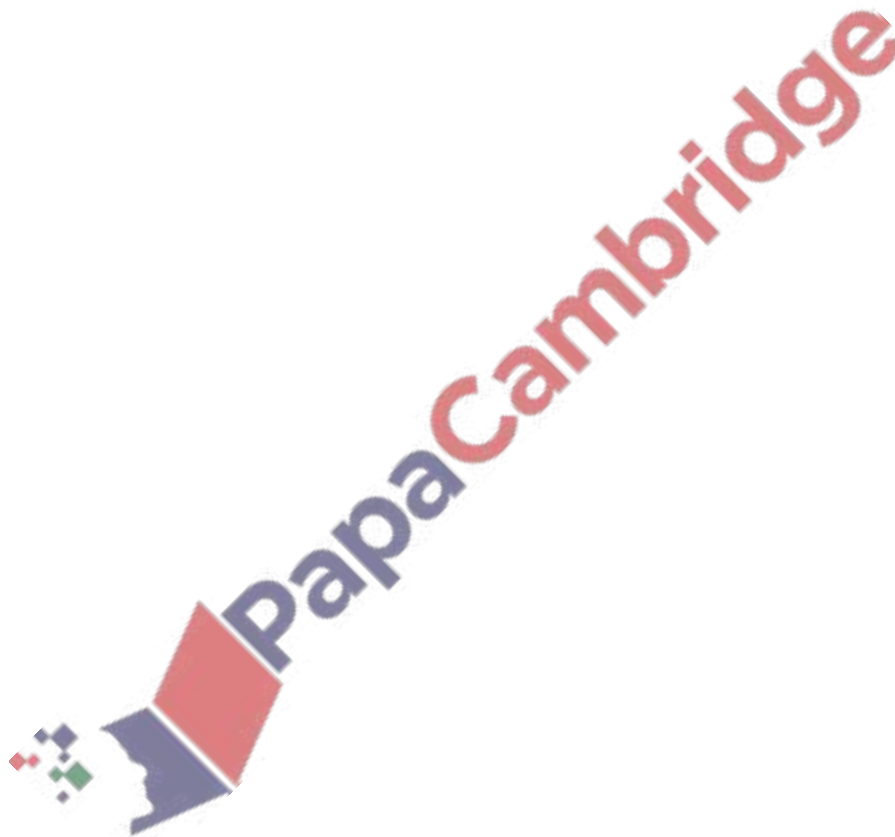
Freddie has two bags of marbles.

Bag X contains 7 red marbles and 3 blue marbles.

Bag Y contains 4 red marbles and 1 blue marble.

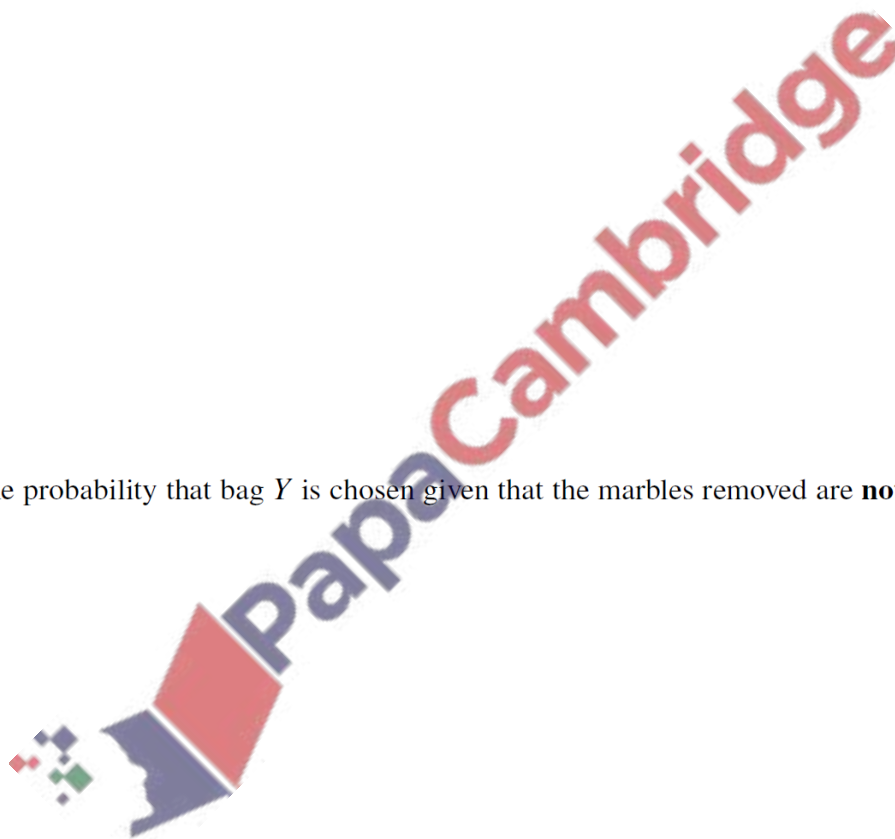
Freddie chooses one of the bags at random. A marble is removed at random from that bag and not replaced. A new red marble is now added to each bag. A second marble is then removed at random from the same bag that the first marble had been removed from.

- (a) Draw a tree diagram to represent this information, showing the probability on each of the branches. [3]



(b) Find the probability that both of the marbles removed from the bag are the same colour. [4]

(c) Find the probability that bag Y is chosen given that the marbles removed are **not** both the same colour. [2]



Tim has two bags of marbles, A and B .

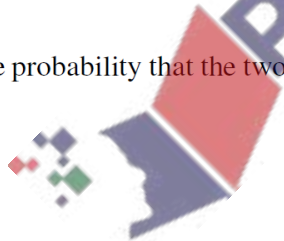
Bag A contains 8 white, 4 red and 3 yellow marbles.

Bag B contains 6 white, 7 red and 2 yellow marbles.

Tim also has an ordinary fair 6-sided dice. He rolls the dice. If he obtains a 1 or 2, he chooses two marbles at random from bag A , without replacement. If he obtains a 3, 4, 5 or 6, he chooses two marbles at random from bag B , without replacement.

(a) Find the probability that both marbles are white. [3]

(b) Find the probability that the two marbles come from bag B given that one is white and one is red. [4]



3. March/2023/Paper_9709/52/No.4

The probability that it will rain on any given day is x . If it is raining, the probability that Aran wears a hat is 0.8 and if it is not raining, the probability that he wears a hat is 0.3. Whether it is raining or not, if Aran wears a hat, the probability that he wears a scarf is 0.4. If he does not wear a hat, the probability that he wears a scarf is 0.1. The probability that on a randomly chosen day it is not raining and Aran is not wearing a hat or a scarf is 0.36.

Find the value of x .

[3]

4. March/2023/Paper_9709/52/No.5

Marco has four boxes labelled K , L , M and N . He places them in a straight line in the order K , L , M , N with K on the left. Marco also has four coloured marbles: one is red, one is green, one is white and one is yellow. He places a single marble in each box, at random. Events A and B are defined as follows.

A : The white marble is in either box L or box M .

B : The red marble is to the left of both the green marble and the yellow marble.

Determine whether or not events A and B are independent.

[3]