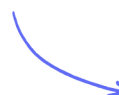


Conditional Probability

Conditional Probability / Combined Conditional Probabilities

Medium (3 questions)	/8
Hard (5 questions)	/26
Very Hard (4 questions)	/31
Total Marks	/65

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Medium Questions

1

1

2

3

4

5

The diagram shows five cards.

Two of the cards are taken at random, without replacement.

Find the probability that both cards show an even number.

(2 marks)

2

P

O

S

S

I

B

I

L

I

T

Y

Morgan picks two of these letters, at random, **without** replacement.

Find the probability that he picks

i) the letter Y first,

[1]

ii) the letter B then the letter Y.

[2]

(3 marks)

- 3** A bag contains 4 red marbles and 2 yellow marbles.
Behnaz picks two marbles at random without replacement.

Find the probability that

i) the marbles are both red,

[2]

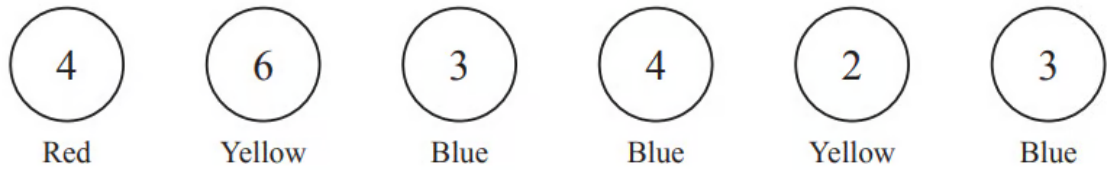
ii) the marbles are not both red.

[1]

(3 marks)

Hard Questions

1



The diagram shows six discs. Each disc has a colour and a number.

Two of the six discs are picked at random **without** replacement. Find the probability that

i) both discs have the number 3,

[2]

ii) both discs have the same colour.

[3]

(5 marks)

2



Morgan picks two of these letters, at random, **without** replacement. Find the probability that he picks two letters that are the same.

(3 marks)

- 3** A bag contains 5 blue marbles and 2 green marbles.
Bryn picks one marble at random without replacement.
If this marble is not green, he picks another marble at random without replacement.
He continues until he picks a green marble.

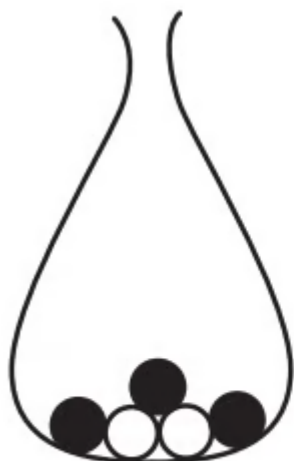
Find the probability that he picks a green marble on his first, second or third attempt.

(4 marks)

- 4** Esme has a bag with 5 green counters and 4 red counters.
She takes three counters at random from the bag without replacement.
Work out the probability that the three counters are all the same colour.

(4 marks)

5 (a)



Bag *A*



Bag *B*

Bag A contains 3 black balls and 2 white balls.

Bag B contains 1 black ball and 3 white balls.

A ball is taken at random from each bag.

i) Show that a black ball is more likely to be taken from bag *A* than from bag *B*.

[1]

ii) Find the probability that the two balls have different colours.

[3]

(4 marks)

- (b)** The balls are returned to their original bags.
Three balls are taken at random from bag *A*, without replacement.

i) Find the probability that they are all black.

[2]

ii) Find the probability that they are all white.

[1]

(3 marks)

- (c)** The balls are returned to their original bags.
A ball is taken at random from bag *A* and its colour is recorded. This ball is then placed in bag *B*.
A ball is then taken at random from bag *B*.
Find the probability that the ball taken from bag *B* has a different colour to the ball taken from bag *A*.

(3 marks)

Very Hard Questions

1



Morgan picks three of these letters, at random, **without** replacement.
Find the probability that

i) all three letters are the same,

[2]

ii) exactly two of the three letters are the same,

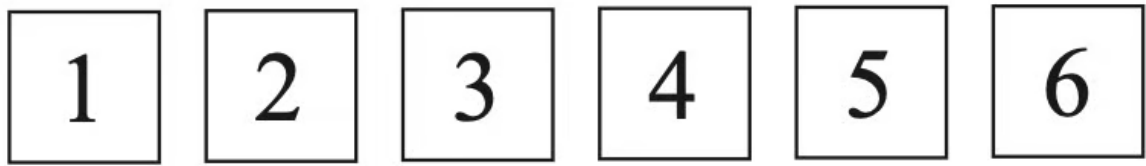
[5]

iii) all three letters are different.

[2]

(9 marks)

2 Suleika has six cards numbered 1 to 6.



Suleika takes two cards at random, without replacement.

i) Find the probability that the sum of the numbers on the two cards is 5.

[3]

ii) Find the probability that at least one of the numbers on the cards is a square number.

[3]

(6 marks)

3



The diagram shows 5 cards.

Donald chooses two of the five cards at random, without replacement.
He works out the total number of dots on these two cards.

i) Find the probability that the total number of dots is 5.

[3]

ii) Find the probability that the total number of dots is an odd number.

[3]

(6 marks)

- 4 (a)** Angelo has a bag containing 3 white counters and x black counters.
He takes two counters at random from the bag, without replacement.
Complete the following statement.

The probability that Angelo takes two black counters is $\frac{x}{x+3} \times \frac{\dots\dots\dots}{\dots\dots\dots}$

(2 marks)

- (b)** The probability that Angelo takes two black counters is $\frac{7}{15}$.

i) Show that $4x^2 - 25x - 21 = 0$.

[4]

ii) Solve by factorisation $4x^2 - 25x - 21 = 0$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

iii) Write down the number of black counters in the bag.

[1]

(8 marks)