

Probability Equations

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **29**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** A bag contains n counters.
5 of the counters are green.

(a) Write down an expression, in terms of n , for the probability that a counter taken at random is green.

[1 mark]

Answer _____

- (b) Two counters are taken at random without replacement.
Write down an expression, in terms of n , for the probability that both counters are green.
Give your answer as a single fraction.

[2 marks]

Answer _____

- 2** A bag contains only red, blue and green counters.
There are x red counters, $2x$ blue counters and 12 green counters.

The probability that a counter taken at random is green is $\frac{1}{4}$
Work out the value of x .

[3 marks]

Answer $x =$ _____

- 3** (a) A bag contains only red counters and blue counters.
There are 12 red counters.
A counter is taken at random.
 $P(\text{red}) > 0.3$
Work out the greatest possible number of blue counters in the bag.

[2 marks]

Answer _____

- (b) A jar contains 40 marbles.
Each marble is green or white.
A marble is taken at random.
 $0.35 < P(\text{green}) < 0.4$
Work out the number of green marbles in the jar.

[2 marks]

Answer _____

- 4** A box contains only milk chocolates and dark chocolates.
number of milk chocolates : number of dark chocolates = 2:3
Priya takes two chocolates at random from the box without replacement.

The probability that she takes one milk chocolate and one dark chocolate is $\frac{18}{35}$
Work out the number of chocolates in the box.
You must show your working.

[4 marks]

Answer _____

- 5** A tray has n cupcakes.
2 of the cupcakes have a coin hidden inside.
Leo takes two cupcakes at random from the tray.
The probability that at least one of Leo's cupcakes has a coin inside is $\frac{3}{5}$

(a) Show that $3n^2 - 23n + 30 = 0$

[3 marks]

(b) Work out the value of n .

[2 marks]

Answer $n =$ _____

- 6** A pencil case contains 4 red pens and 6 black pens.
Omar puts x more black pens in the pencil case.
Two pens are then taken at random without replacement.
The probability that both pens are red is $\frac{2}{35}$
Work out the value of x .

[5 marks]

Answer $x =$ _____

- 7 A jar contains n sweets.
5 of the sweets are lemon flavour.
Tia takes two sweets at random from the jar without replacement.
The probability that exactly one of the two sweets is lemon flavour is $\frac{35}{66}$
Work out the value of n .
You must show your working.

[5 marks]

$n =$ _____