Name: SOLUTIONS

GCSE (1 - 9)

Probability Equation Questions

Solutions by
Kenneth Stafford
MATHS TUTOR
ken@kennethstafford.co.uk

These questions are compiled from released Pearson Edexcel GCSE maths exam papers

They contain exam questions from up until the ***November 2023*** exam series

More recent exam papers do exist but are withheld for mock exams

As new exam papers are released these worksheets will gradually be updated

The **most current** version of these worksheets will always be available at: kennethstafford.co.uk

Past Papers:	**Similar Worksheets:**
Solutions:	**This worksheet:**

1

There are only green pens and blue pens in a box.

There are three more blue pens than green pens in the box.
There are more than 12 pens in the box.

Simon is going to take at random two pens from the box.

The probability that Simon will take two pens of the same colour is $\frac{27}{55}$

Work out the number of green pens in the box.

Blue = $x+3$

Green = x

Total = $2x+3$

$$\frac{(x+3)(x+2)}{(2x+3)(2x+2)} + \frac{x(x-1)}{(2x+3)(2x+2)} = \frac{27}{55}$$

$$\frac{x^2+5x+6+x^2-x}{4x^2+10x+6} = \frac{27}{55}$$

$$\frac{2x^2+4x+6}{4x^2+10x+6} = \frac{27}{55}$$

$$55(2x^2+4x+6) = 27(4x^2+10x+6)$$

$$110x^2+220x+330 = 108x^2+270x+162$$

$$2x^2-50x+168 = 0$$

$$x^2-25x+84 = 0$$

$$(x-21)(x-4)=0$$

$x=21$ $x=4$

21

(Total for Question 22 is 6 marks)

[Edexcel, GCSE, Autumn 2018, Paper 1H, Q22]

2

There are only r red counters and g green counters in a bag.

A counter is taken at random from the bag.

The probability that the counter is green is $\frac{3}{7}$

The counter is put back in the bag.

2 more red counters and 3 more green counters are put in the bag.
A counter is taken at random from the bag.

The probability that the counter is green is $\frac{6}{13}$

Find the number of red counters and the number of green counters that were in the bag originally.

Red = $4x$

Green = $3x$

Total = $7x$

$$\frac{3x+3}{7x+5} = \frac{6}{13}$$

$$13(3x+3) = 6(7x+5)$$

$$39x + 39 = 42x + 30$$

$$39 = 3x + 30$$

$$9 = 3x$$

$$x = 3$$

red counters $4 \times 3 = 12$

green counters $3 \times 3 = 9$

(Total for Question 22 is 5 marks)

[Edexcel, GCSE, Summer 2019, Paper 1H, Q22]

3

There are only red sweets and yellow sweets in a bag.

There are n red sweets in the bag.
There are 8 yellow sweets in the bag.

Sajid is going to take at random a sweet from the bag and eat it.

He says that the probability that the sweet will be red is $\frac{7}{10}$

(a) Show why the probability cannot be $\frac{7}{10}$

red = n
yellow = 8
total = n+8

$\frac{n}{n+8} = \frac{7}{10}$

$10n = 7(n+8)$

$10n = 7n + 56$

$3n = 56$

$n = \frac{56}{3} = 18.6$

n must be a whole number.

(3)

After Sajid has taken the first sweet from the bag and eaten it, he is going to take at random a second sweet from the bag.

Given that the probability that both the sweets he takes will be red is $\frac{3}{5}$

(b) work out the number of red sweets in the bag.
You must show all your working.

$\frac{n}{n+8} \times \frac{n-1}{n+7} = \frac{3}{5}$

$\frac{n^2-n}{n^2+15n+56} = \frac{3}{5}$

$5(n^2-n) = 3(n^2+15n+56)$

$5n^2 - 5n = 3n^2 + 45n + 168$

$2n^2 - 50n - 168 = 0$

$n^2 - 25n - 84 = 0$

$(n-28)(n+3)$

$n = 28$

28

(5)

(Total for Question 20 is 8 marks)

[Edexcel, GCSE, Autumn 2020, Paper 2H, Q20]

4

There are only blue pens and red pens in a box.

The number of blue pens is four times the number of red pens.

Rita takes at random one pen from the box.
She records the colour of the pen and then replaces it in the box.
Rita does this n times, where $n \geqslant 2$

Write down an expression, in terms of n, for the probability that Rita gets a blue pen at least once and a red pen at least once.

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(Total for Question 22 is 2 marks)

[Edexcel, GCSE, Summer 2023, Paper 2H, Q22]

5

There is a total of y counters in a box.

There are x pink counters and 5 blue counters in the box.
The rest of the counters are green.

$$x : y = 1 : 3$$

Freda takes at random two counters from the box.

Find, in terms of x, an expression for the probability that Freda takes two counters of the same colour.

Give your answer as a fraction in the form $\frac{ax^2 + bx + c}{dx^2 + ex}$ where a, b, c, d and e are integers.

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(Total for Question 24 is 5 marks)

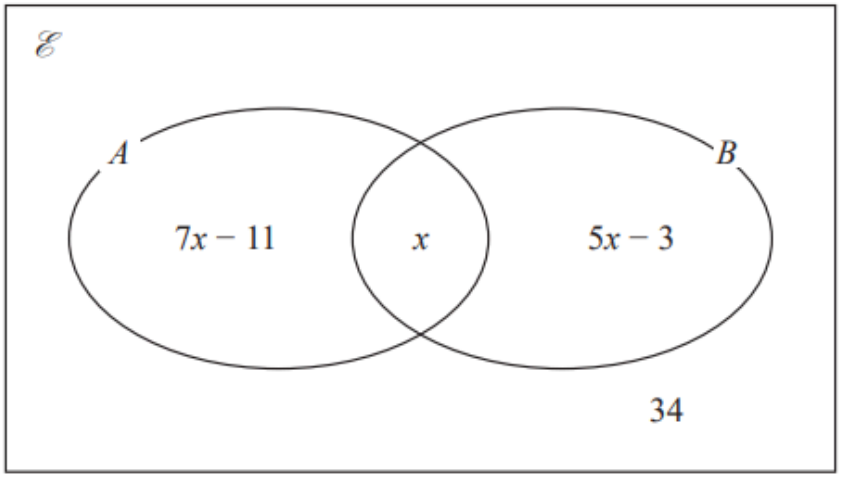
[Edexcel, GCSE, Summer 2023, Paper 3H, Q24]

6

Vicky has a collection of medals.

The Venn diagram gives information about the number of medals in her collection where

$\mathscr{E}$ = {all medals}
A = {English medals}
B = {gold medals}



Vicky is going to take at random a medal from her collection.

Given that the medal is gold, the probability that the medal is English is $\frac{2}{11}$

Work out the number of medals in Vicky's collection.

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(Total for Question 21 is 4 marks)

[Edexcel, GCSE, November 2023, Paper 2H, Q21]