AQA – Probability – A2 Mathematics P3
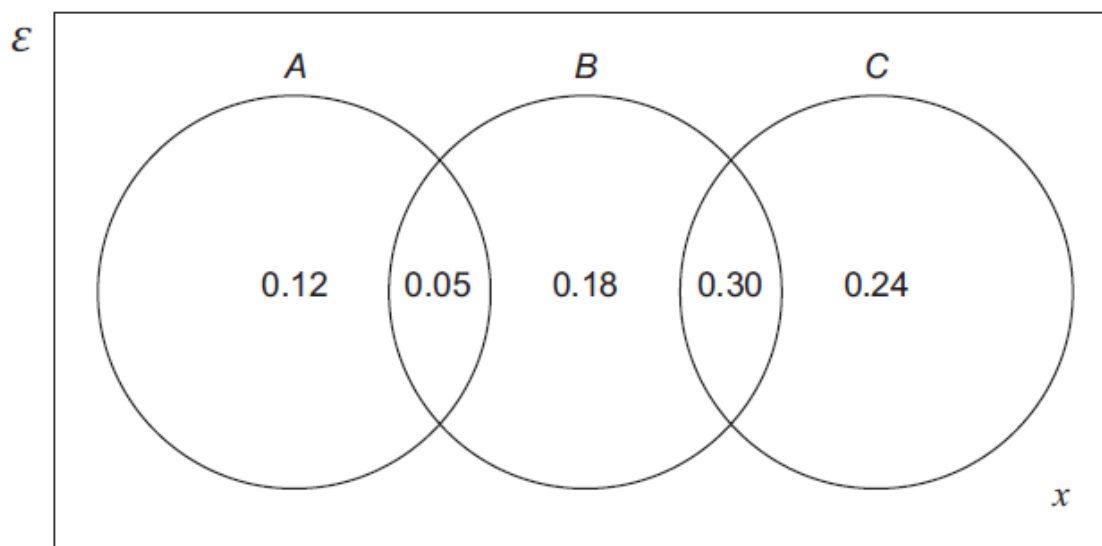
1. June/2020/Paper_3/No.10

    The probabilities of events *A*, *B* and *C* are related, as shown in the Venn diagram below.

    ε

    A   *B*   *C*

    0.12   0.05   0.18   0.30   0.24

    x

    Find the value of *x*.

    Circle your answer.

    [1 mark]

    0.11   0.46   0.54   0.89

2. June/2020/Paper_3/No.11

    The table below shows the temperature on Mount Everest on the first day of each month.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°C)	−17	−16	−14	−9	−2	2	6	5	−3	−4	−11	−18

    Calculate the standard deviation of these temperatures.

    Circle your answer.

    [1 mark]

    −6.75   5.82   8.24   67.85

3. June/2020/Paper_3/No.13

Diedre is a head teacher in a school which provides primary, secondary and sixth-form education.

There are 200 teachers in her school.

The number of teachers in each level of education along with their gender is shown in the table below.

	Primary	Secondary	Sixth-form
Male	9	24	23
Female	35	85	24

(a) A teacher is selected at random. Find the probability that:

(a) (i) the teacher is female

[1 mark]

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(a) (ii) the teacher is **not** a sixth-form teacher.

[1 mark]

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(b) Given that a randomly chosen teacher is male, find the probability that this teacher is **not** a primary teacher.

[2 marks]

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(c) Diedre wants to select three different teachers at random to be part of a school project.

Calculate the probability that all three chosen are secondary teachers.

[2 marks]

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4. June/2020/Paper_3/No.18(a)

Tiana is a quality controller in a clothes factory. She checks for four possible types of defects in shirts.

Of the shirts with defects, the proportion of each type of defect is as shown in the table below.

Type of defect	Colour	Fabric	Sewing	Sizing
Probability	0.25	0.30	0.40	0.05

Shirts with defects are packed in boxes of 30 at random.

(a) Find the probability that:

(a) (i) a box contains exactly 5 shirts with a colour defect

[2 marks]

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(a) (ii) a box contains fewer than 15 shirts with a sewing defect

[2 marks]

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(a) (iii) a box contains at least 20 shirts which do **not** have a fabric defect.

[3 marks]

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5. June/2019/Paper_3/No.14

A survey was conducted into the health of 120 teachers.

The survey recorded whether or not they had suffered from a range of four health issues in the past year.

In addition, their physical exercise level was categorised as low, medium or high.

50 teachers had a low exercise level, 40 teachers had a medium exercise level and 30 teachers had a high exercise level.

The results of the survey are shown in the table below.

	Low exercise	Medium exercise	High exercise
Back trouble	14	7	10
Stress	38	14	5
Depression	9	2	1
Headache/Migraine	4	5	5

(a) Find the probability that a randomly selected teacher:

(a) (i) suffers from back trouble and has a high exercise level;

[1 mark]

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(a) (ii) suffers from depression.

[2 marks]

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(a) (iii) suffers from stress, given that they have a low exercise level.

[2 marks]

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(b) For teachers in the survey with a low exercise level, explain why the events 'suffers from back trouble' and 'suffers from stress' are **not** mutually exclusive.

[2 marks]

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