Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Introduction to probability

Time allowed: 35 minutes

Subject code **0580**

Mathematics

Questions from Paper 1, Paper 2, Paper 3 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 26

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 26 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1 The probability that a train is late is 0.15 .

Write down the probability that the train is not late.

..... [1]

Basic probability Click for more variations

1	0.85 oe	**1**	

2

S	**P**	**A**	**C**	**E**	**S**

One of the 6 letters is taken at random.

(a) Write down the probability that the letter is S.

Answer(a) ..... [1]

(b) The letter is replaced and again a letter is taken at random.
This is repeated 600 times.

How many times would you expect the letter to be S?

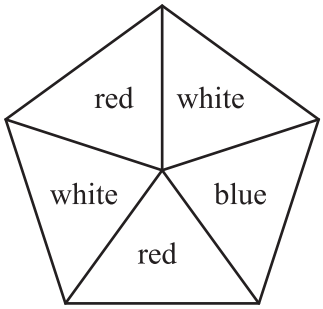
Answer(b) ..... [1]

(a) Basic probability (b) Relative frequency and expected outcomes Click for more variations

2	**(a)**	$\frac{2}{6}$ oe	**1**	
	(b)	200 Final answer	**1FT**	FT 600 × *their* **(a)** providing *their* **(a)** is a probability

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3



The diagram shows a fair 5-sided spinner.
The spinner is spun once.

(a) Write down the colour the spinner is least likely to land on.

..... [1]

(b) Find the probability that the spinner lands on white.

..... [1]

(c) Find the probability that the spinner does not land on red.

..... [1]

(a) Basic probability (b) Basic probability (c) Basic probability Click for more variations

3(a)	Blue	**1**	

3(b)	$\frac{2}{5}$ oe	**1**	
3(c)	$\frac{3}{5}$ oe	**1**	

4 Dominic asks 30 students in his class if they are right-handed or left-handed.
7 students are left-handed.

Work out the expected number of left-handed students in the whole school of 960 students.

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..... [2]

Relative frequency and expected outcomes Click for more variations

4	224	**2**	**M1** for $\frac{7}{30}[\times 960]$ oe

5 The probability that a sweet made in a factory is the wrong shape is 0.0028 .
One day, the factory makes 25 000 sweets.

Calculate the number of sweets that are expected to be the wrong shape.

..... [2]

Relative frequency and expected outcomes Click for more variations

5	70	**2**	**M1** for 25 000 × 0.0028 oe

6 A spinner has five sides.
Each side is painted red, blue, green, yellow or orange.
The table shows some of the probabilities of the spinner landing on each colour.

Colour	Red	Blue	Green	Yellow	Orange
Probability	0.3	0.16	0.18	0.25	

(a) Complete the table. [2]

(b) Dan spins the spinner once.

Find the probability that the spinner lands on red or blue.

..... [2]

(a) Basic probability (b) Basic probability Click for more variations

6(a)	0.11 oe	**2**	**M1** for 1 – (0.3 + 0.16 + 0.18 + 0.25) oe or **B1** for 0.89 oe
6(b)	0.46 oe	**2**	**M1** for 0.3 + 0.16

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7 A bag contains red, yellow, blue and green cards.
The table shows the probability of taking a red card and a yellow card.
The probability of taking a blue card or a green card is in the ratio blue : green = 5 : 2 .

Complete the table.

Colour	red	yellow	blue	green
Probability	0.53	0.19		

[3]

Ratios Click for more variations

7	0.2[0] 0.08 oe	**3**	**M2** for $\frac{1-(0.53+0.19)}{7}$ oe or **M1** for 1 – (0.53 + 0.19) oe

8 A vase contains flowers that are red or pink or white.
Ruth picks a flower at random from the vase.
The probability that the flower is **not** red is 0.9 .
The probability that the flower is **not** pink is 0.65 .

Find the probability that the flower is white.

..... [2]

Basic probability Click for more variations

8	0.55 oe	**2**	**B1** for P(red) = 0.1 or P(pink) = 0.35 or **M1** for 0.9 + 0.65 – 1 or 1 – (0.1 + 0.35)

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9 Jacinda plays a game with her friend.
She can win, lose or draw the game.
The probability that she wins the game is 0.28 .

(a) Jacinda is twice as likely to draw the game as to lose the game.

Work out the probability that she loses the game.

..... [2]

(b) Jacinda plays the game 150 times.

Find the expected number of times that **she wins**.

..... [1]

(a) Basic probability (b) Relative frequency and expected outcomes Click for more variations

9(a)	0.24 oe	**2**	**M1** for 1 – 0.28 oe
9(b)	42	**1**	

10 A bag contains 7 red discs, 5 green discs and 2 pink discs.

(a) Helen takes one disc at random, records the colour and replaces it in the bag.
She does this 140 times.

Find how many times she expects to take a green disc.

..... [2]

(b) Helen adds 9 green discs and some pink discs to the discs already in the bag.
The probability of taking a green disc is now $\frac{2}{7}$.

Find the number of pink discs that Helen added to the bag.

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..... [2]

(a) Relative frequency and expected outcomes (b) Basic probability Click for more variations

10(a)	50	**2**	**M1** for $\frac{5}{7+5+2}$ [$\times 140$] or $\frac{140}{7+5+2}$ [$\times 5$]
10(b)	26	**2**	**M1** for $\frac{5+9}{n} = \frac{2}{7}$ oe or $\frac{5+9}{p+7+5+2+9} = \frac{2}{7}$ oe

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