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

| Surname | Other names |
|---|---|
| | |

Centre number | | | | | |

Candidate number | | | | |

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# Recurring decimals

Time allowed: 35 minutes

**Subject code** **0580**

# Mathematics

## Paper 2 (Extended)

**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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**Turn over ►**



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

**1** Write the recurring decimal $0.\dot{7}$ as a fraction.

..... [1]

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| | | | |
|---|---|---|---|
| **1** | $\frac{7}{9}$ | **1** | |

**2** Write the recurring decimal $0.\dot{2}$ as a fraction.
[$0.\dot{2}$ means 0.222…]

..... [2]

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| | | | |
|---|---|---|---|
| **2** | $\frac{2}{9}$ oe, must be a fraction | **2** | **M1** for $2.\dot{2} - 0.\dot{2}$ oe<br>or **B1** for $\frac{k}{9}$ |

**3** Write the recurring decimal $0.1\dot{5}$ as a fraction.
[$0.1\dot{5}$ means 0.1555...]

*Answer* ..... [2]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **3** | $\frac{14}{90}$ oe must be fraction | **2** | **M1** for $15.\dot{5} - 1.\dot{5}$ oe<br>or<br>**B1** for $\frac{k}{90}$ |

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**4** Write $0.\dot{2}\dot{4}$ as a fraction in its simplest form.

..... [2]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **4** | $\frac{8}{33}$ cao | **2** | **B1** for $\frac{24}{99}$ oe<br>or **M1** for 24.24… – 0.24… oe |

**5** Write the recurring decimal $0.\dot{6}\dot{3}$ as a fraction in its lowest terms.
You must show all your working.

..... [3]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **5** | $10^{k+2} \times [0].\dot{6}\dot{3} - 10^{k} \times [0].\dot{6}\dot{3}$ oe<br>where $k > 1$ | **M1** | |
| | $\frac{63}{99}$ or equivalent fraction | **A1** | e.g. $\frac{6300}{9900}$ but not $\frac{7}{11}$ |
| | $\frac{7}{11}$ | **B1** | |

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**6** Write $0.4\dot{2}$ as a fraction in its simplest form.
You must show all your working.

..... [3]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **6** | 42.22… – 4.22… oe | **M1** | **M1** for correct working shown |
| | $\frac{19}{45}$ cao | **A2** | **A1** for $\frac{38}{90}$ oe seen<br>If **M0** scored **SC1** for $\frac{k}{90}$ or for answer $\frac{19}{45}$ with insufficient working. |

**7** Write $0.62\dot{1}$ as a fraction in its simplest form.
You must show all your working.

..... [3]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **7** | 621.21… – 6.21… oe | **M1** | |
| | $\frac{41}{66}$ cao | **A2** | **A1** for $\frac{615}{990}$ oe<br>If M0 scored **SC1** for $\frac{k}{990}$ or for answer $\frac{41}{66}$ with insufficient working |

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**8** Write $0.4\dot{1}\dot{9}$ as a fraction in its simplest form.
You must show all your working.

..... [3]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **8** | $419.\dot{1}\dot{9} - 4.\dot{1}\dot{9}$ oe | **M1** | |
| | $\frac{83}{198}$ cao | **A2** | **A1** for $\frac{415}{990}$ oe<br>If M0 scored **SC1** for $\frac{k}{990}$ or correct answer with insufficient working |

**9** Work out $0.1\dot{1}\dot{4} + 0.2$ .
Give your answer as a fraction.

..... [3]

Recurring decimals Click for more variations

| | | | |
|---|---|---|---|
| **9** | $\frac{311}{990}$ oe fraction | **3** | **M2** for $314.14\ldots - 3.14\ldots$ oe<br>or $\frac{113}{990} + \frac{198}{990}$<br>or **M1** for $114.14\ldots - 1.14\ldots$ oe<br>or $0.3\dot{1}\dot{4}$ or $\frac{113}{990}$ |

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**10** Work out.

$$\frac{5}{9} + 0.2\dot{8}$$

Give your answer as a fraction in its simplest form.

..... [4]

Recurring decimals Click for more variations

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| | | | |
|---|---|---|---|
| **10** | $\frac{38}{45}$ cao | **4** | **B3** for $\frac{76}{90}$ oe fraction<br><br>OR<br><br>**M3** for any complete correct method with common denominators that would reach $\frac{76}{90}$ oe e.g.<br><br>$\frac{28.8\ldots - 2.8\ldots}{100-10} + \frac{50}{90}$ oe<br>$\frac{50}{90} + \frac{18}{90} + \frac{8}{90}$ oe<br>$\frac{84.4\ldots - 8.4\ldots}{100-10}$ oe<br><br>or **M2** for any correct method to convert $0.2\dot{8}$ to fractional form e.g.<br><br>$\frac{28.8\ldots - 2.8\ldots}{100-10}$ oe<br>$\frac{2}{10} + \frac{8.8\ldots - 0.8\ldots}{100-10}$ oe<br><br>or **M1** for correct method to add *their* fractions with a common denominator e.g.<br><br>$\frac{50}{90} + their\frac{26}{90}$ oe<br>$\frac{50}{90} + \frac{18}{90} + their\frac{8}{90}$ oe<br><br>or for method to subtract to eliminate recurring parts<br><br>$28.8\ldots - 2.8\ldots$ oe<br>$8.88\ldots - 0.08\ldots$ oe<br><br>or **B1** for a correct conversion between a relevant recurring decimal and a fraction e.g.<br>$\frac{5}{9} = 0.\dot{5}$, $0.0\dot{8} = \frac{8}{90}$ |

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