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

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

Centre number | | | | | |

Candidate number | | | | |

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# Constructions and loci

Time allowed: 30 minutes

**Subject code** **0580**

# Mathematics

## Questions from Paper 1, Paper 2 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

**/ 24**

### 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 24 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 diagram shows the base of a triangle.
The lengths of the other two sides are 6 cm and 4 cm.

**Using a ruler and compasses only**, construct the other two sides of the triangle.
Show all your construction arcs. [2]

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| | | | |
|---|---|---|---|
| **1** | Correct triangle with sides 6 cm and 4 cm **and** correct arcs | **2** | **B1** for correct triangle with no or incorrect arcs or correct arcs with no or inaccurate sides drawn |

**2** In triangle $ABC$, $AB = 7$ cm, $BC = 4$ cm and $AC = 6$ cm.

**Using a ruler and compasses only**, construct triangle $ABC$.
The side $BC$ has been drawn for you.




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[2]

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| | | | |
|---|---|---|---|
| **2** | Fully correct triangle<br>with correct arcs | **2** | **B1** for correct triangle without arcs<br>or for correct position of arcs<br>If zero scored,<br>**SC1** for fully correct reversed triangle with arcs ie $AB = 6$ cm and $AC = 7$ cm<br>**or** for triangle with only one of $AB$ **or** $AC$ correct length with suitable arcs |

**3** Construct a triangle with sides of length 55 mm, 68 mm and 85 mm.

The 85 mm side has been drawn for you.



[2]

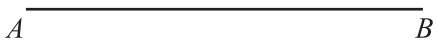
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| | | | |
|---|---|---|---|
| **3** | correct triangle with correct arcs | **2** | **B1** for correct triangle without arcs or 1 correct side with arcs |

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**4** The line $AB$ is one side of an equilateral triangle $ABC$.

**Using a straight edge and compasses only**, construct triangle $ABC$.




[2]

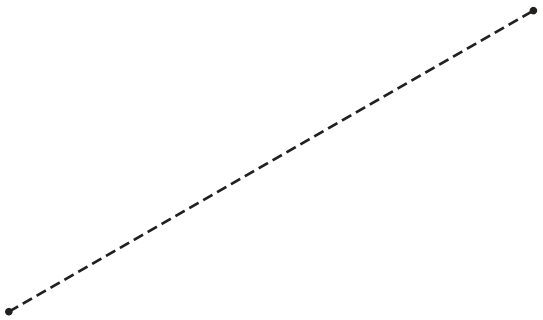
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| | | | |
|---|---|---|---|
| **4** | Equilateral triangle with correct arcs | **2** | **M1** for clear evidence of constructed 60° angles or arcs crossing equal in length to $AB$ or an accurate diagram with no/incorrect arcs |

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**5** A rhombus has side length 6.5 cm.
The rhombus can be constructed by drawing two triangles.

**Using a ruler and compasses only**, construct the rhombus.
Leave in your construction arcs.
One diagonal of the rhombus has been drawn for you.



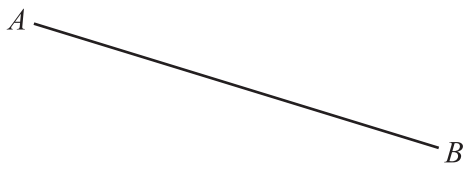
[2]

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| | | | |
|---|---|---|---|
| **5** | Accurate construction of rhombus with sides 6.5 cm and correct construction arcs. | **2** | **B1** for accurate diagram with no/wrong arcs<br>or for one triangle (6.5 cm, 6.5 cm, 8 cm) correctly constructed with correct arcs or for four correct arcs |

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**6**




**(a)** Measure the length of line *AB* in centimetres.

..... cm [1]

**(b)** Draw a line that is parallel to line *AB*. [1]

(a) Constructions and loci (b) Constructions and loci Click for more variations

| | | | |
|---|---|---|---|
| **6**(a) | 5.6 | **1** | |
| **6**(b) | Ruled line parallel to *AB* | **1** | |

**7** **In this question use a ruler and compasses only and show all your construction arcs.**

Using a scale of 1 centimetre to represent 50 metres, construct a triangle with sides 550 m, 450 m and 300 m. The 300 m side has been drawn for you.



[2]

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| | | | |
|---|---|---|---|
| **7** | Correct triangle with correct arcs | **2** | **B1** for correct triangle without arcs or 1 correct side with arcs |

**8** Triangle $ABC$ has sides $AB = 40\,\text{m}$, $BC = 25\,\text{m}$ and $AC = 35\,\text{m}$.

Using a scale of 1 cm to represent 5 m, construct triangle $ABC$.
**The construction must be completed using a ruler and compasses only.**
**All construction arcs must be clearly shown**.

*Answer*




[3]

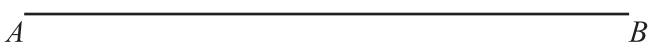
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| | | | |
|---|---|---|---|
| **8** | Triangle drawn correctly with ruler **and** arcs | **3** | **M1** for one side drawn to correct length<br><br>**and M1** for clear method of crossing arcs even if wrong scale or inaccurate |

**9** In triangle $ABC$, $AC = 21\,\text{m}$ and $BC = 15.9\,\text{m}$.

**Using a ruler and compasses only**, complete the scale drawing of the triangle.
Use a scale of 1 cm to represent 3 m.
The side $AB$ is drawn for you.

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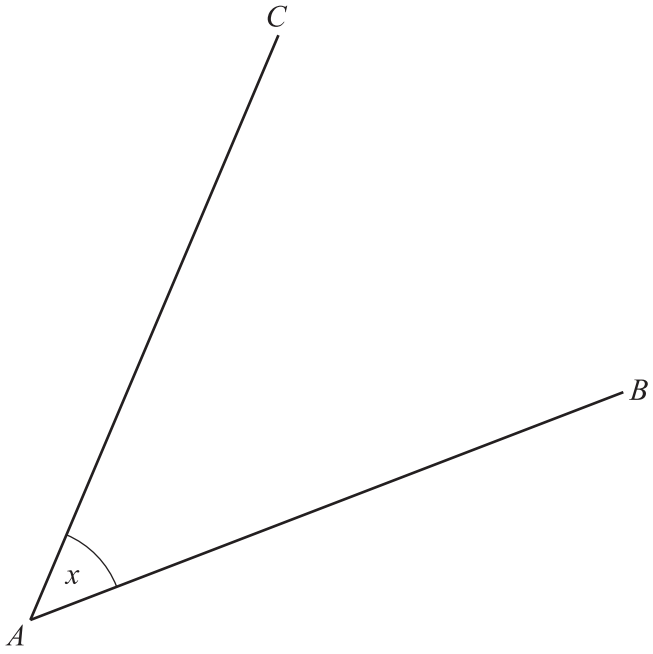

Scale : 1 cm to 3 m

[3]

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| | | | |
|---|---|---|---|
| **9** | Correct triangle constructed with $AC = 7$ cm and $BC = 5.3$ cm and intersecting arcs | **3** | **B2** for correct triangle with no incorrect arcs or for a triangle with reversed sides with correct arcs<br><br>or **B1** for any triangle with a side of 7 cm or a side of 5.3 cm<br><br>or for 7[cm] or 5.3[cm] soi |

**10**




**(a)** Measure the size of angle $x$.

..... [1]

**(b)** Measure the length of line $AB$ in millimetres.

..... mm [1]

**(c)** Mark the midpoint, $M$, of line $AB$. [1]

**(d)** Draw a line through the point $M$ that is perpendicular to line $AB$. [1]

(a) Basic angle properties (b) Constructions and loci (c) Constructions and loci (d) Constructions and loci

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| | | | |
|---|---|---|---|
| **10**(a) | 46° | **1** | |
| **10**(b) | 84 | **1** | |
| **10**(c) | Mid-point marked 42 mm along $AB$ from $A$. | **1** | |
| **10**(d) | Line at 90° to $AB$ at $M$. | **1** | **FT** *their* mid-point |

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