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

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Ratio and proportion

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

/ 27

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 27 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 Chris and Max share \$45 in the ratio Chris:Max = 7 : 2 .

Calculate how much Chris receives.

Answer \$ ..... [2]

Ratios Click for more variations

1	35	2	**M1** for 45 ÷ (7 + 2) **SC1** for answer = 10

2 The ratio of Anne's height : Ben's height is 7 : 9.
Anne's height is 1.4 m.

Find Ben's height.

Answer ..... m [2]

Ratios Click for more variations

2	1.8	**2**	**M1** for 1.4 ÷ 7 or **SC1** for **answer** 180

3 Mortar is a mixture of cement, sand and lime in the ratio

cement : sand : lime = 1 : 5 : 2.

Calculate how much sand there is in a 12 kg bag of this mortar.

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Answer ..... kg [2]

Ratios Click for more variations

3	7.5	**2**	**M1** for 12 × 5 ÷ (1 + 5 + 2) oe

4 The total mass of 38 spoons is 1824 g.

Work out the mass of 53 spoons.

Answer ..... g [2]

Working with proportion Click for more variations

4	2544	**2**	**M1** for 1824 ÷ 38 [×53] oe

5 Carl packs pens into boxes.
Each box holds 68 pens.
Carl has 980 pens and 14 boxes.

Does Carl have enough boxes to pack all the pens?
Show how you decide.

..... because .....

..... [2]

Working with proportion Click for more variations

5	Correct working shown leading to answer No with a correct statement. e.g. 980 ÷ 68 [= 14.4…] No, he would need 15 boxes oe or 14 × 68 [= 952] No, he can only pack 952 or he has 28 remaining oe or 980 ÷ 14 [= 70] No, each box would need to hold 70 pens oe	**2**	**B1** for 980 ÷ 68 or No, he would need 15 boxes oe or 14 × 68 or No, he can only pack 952 or he has 28 remaining oe or 980 ÷ 14 or No, each box would need to hold 70 pens oe

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6 70 students study one of French, Spanish and German.

The ratio number who study French : number who study Spanish = 3 : 7.
15 students study French.

Find the number of students who study German.

..... [3]

Ratios Click for more variations

6	20	**3**	**M2** for $70-\left(15+\frac{15\times 7}{3}\right)$ oe or **M1** for $\frac{15}{3}\times k$, $k = 1$, 7 or 10

7 Jo and Mo share \$26.
Jo receives \$5 more than Mo.

Find the ratio Jo's money : Mo's money.
Give your answer in its simplest form.

..... : ..... [3]

Problem solving with ratios Click for more variations

7	31 : 21	**3**	**B2** for equivalents e.g. 15.5 oe and 10.5 oe or for an equivalent ratio e.g. 3.1 : 2.1 or **M1** for e.g. $x + 5 + x = 26$ oe or $x - 5 + x = 26$ oe

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8 Mass of box A : Mass of box B = 4 : 7

The mass of box B is 2.4 kg more than the mass of box A.

Calculate the mass of box A and the mass of box B.

box A ..... kg

box B ..... kg

[3]

Problem solving with ratios Click for more variations

8	[A =] 3.2 [B =] 5.6	**3**	**B2** for one correct or for both correct but reversed or **M1** for $\frac{2.4}{7-4} \times k$ where k = 1, 4, 7 or 11 oe or for $\frac{x}{x+2.4} = \frac{4}{7}$ oe

9 Ralf and Susie share $57 in the ratio 2 : 1.

(a) Calculate the amount Ralf receives.

$ ..... [2]

(b) Ralf gives $2 to Susie.

Calculate the new ratio Ralf's money : Susie's money.
Give your answer in its simplest form.

..... : .....[2]

(a) Ratios (b) Ratios Click for more variations

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9	**(a)**	38	**2**	**M1** for 57 ÷ (2 + 1) or better
	(b)	12 : 7	**2**	**M1FT** for *their* 38 – 2 **and** *their* 19 + 2 seen dep on sum = 57 If M0 **SC1** for answer 7 : 12

10 **(a)** Chi shares \$480 in the ratio 2 : 3 : 7.

Calculate the value of the largest share.

\$ ..... [2]

(b) Simplify these ratios.

(i) 98 : 147

..... : ..... [1]

(ii) $2^{450} : 2^{452}$

..... : ..... [1]

(a) Ratios (b)(i) Ratios (b)(ii) Ratios Click for more variations

10(a)	280	**2**	**M1** for $\frac{480}{2+3+7} \times k$, $k =$ 1,2,3 or 7
10(b)(i)	2:3 cao	**1**	
10(b)(ii)	1:4 cao	**1**	

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