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CAMBRIDGE
International Education

Cambridge IGCSE™

MATHEMATICS **0580/23**

Paper 2 (Extended) **May/June 2026**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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0580/23 Mark Scheme June 2026

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Mathematics-specific marking principles

1 Unless a particular method has been specified in the question, full marks may be awarded for any correct method. However, if a calculation is required then no marks will be awarded for a scale drawing.

2 Unless specified in the question, non-integer answers may be given as fractions, decimals or in standard form. Ignore superfluous zeros, provided that the degree of accuracy is not affected.

3 Allow alternative conventions for notation if used consistently throughout the paper, e.g. commas being used as decimal points.

4 Unless otherwise indicated, marks once gained cannot subsequently be lost, e.g. wrong working following a correct form of answer is ignored (isw).

5 Where a candidate has misread a number or sign in the question and used that value consistently throughout, provided that number does not alter the difficulty or the method required, award all marks earned and deduct just 1 A or B mark for the misread.

6 Recovery within working is allowed, e.g. a notation error in the working where the following line of working makes the candidate's intent clear.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
^	More information required
A0	Accuracy mark awarded zero
A1	Accuracy mark awarded one
A2	Accuracy mark awarded two
A3	Accuracy mark awarded three
B0	Independent mark awarded zero
B1	Independent mark awarded one
B2	Independent mark awarded two
B3	Independent mark awarded three
BOD	Benefit of the doubt

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Annotation	Meaning
C	Communication mark
	Incorrect
FT	Follow through
Highlighter	Highlight a key point in the working
ISW	Ignore subsequent work
M0	Method mark awarded zero
M1	Method mark awarded one
M2	Method mark awarded two
M3	Method mark awarded three
MR	Misread
O	Omission
Off-page comment	Allows comments to be entered at the bottom of the RM marking window and then displayed when the associated question item is navigated to.
On-page comment	Allows comments to be entered in speech bubbles on the candidate response.
Pre	Premature rounding/approximation
SC	Special case
SEEN	Indicates that work/page has been seen
TE	Transcription error

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Annotation	Meaning
	Correct
	Correct answer from incorrect working

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MARK SCHEME NOTES

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

Types of mark

M Method marks, awarded for a valid method applied to the problem.

A Accuracy mark, awarded for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.

B Mark for a correct result or statement independent of Method marks.

When a part of a question has two or more 'method' steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. The notation 'dep' is used to indicate that a particular M or B mark is dependent on an earlier mark in the scheme.

Abbreviations

awrt	answers which round to
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
nfww	not from wrong working
oe	or equivalent
rot	rounded or truncated
SC	Special Case
soi	seen or implied

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Question	Answer	Marks	Partial Marks	Guidance
1	25	**2**	**M1** for $\frac{30}{120}$ [× 100] oe	Accept $\frac{1}{4}$ or 0.25 for M1; ignore $ sign.
2(a)	24 192	**2**	**B1** for one correct or **M1** for 1 student = 6° or $\frac{360}{60}$ [× k] where k = 1, 4 or 32 or $\frac{144}{24}$ [× k] where k = 1, 4 or 32	M1 implied by 144 ÷ 6 Award equivalent part marks if converted to percentages (40, 6.66…, 53.3).
2(b)	Correct labelled pie chart	**2**	FT for 2 marks provided *their* 3 angles add to 360 **B1** for one correct sector (ignore labels) or FT from *their* table	accuracy ±2° For 2 marks, labels must be drinks and correct. For 2 marks, there must be only 3 sectors. Check the 'best' two sectors for accuracy. Lines must be straight; condone good freehand.
3	$-1 \leqslant x < 5$	**2**	**B1** for $-1 \leqslant x$ or $x < 5$	For 2 marks, accept • $-1 \leqslant x$ **and** $x < 5$ (must include 'and') • $5 > x \geqslant -1$ Condone B1 only picked out from an incorrectly formed combined inequality. Note: 0 marks for • $-1 < x \leqslant 5$ • $5 \geqslant x > -1$ Condone use of a different letter (not *O*).
4(a)	240	**2**	**M1** for ordered list 210, 220, 230, 235, 245, 245, 265, 850 or identifying 235 and 245	Ordered list of first 5 or last 5 is sufficient; can be a diagram, can be highest to lowest and can have positions above the numbers. e.g. both circled in original list
4(b)	correct explanation, e.g. 850 is much larger than the other values, which affects the mean	**1**		Accept any valid reason.

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GradeMax

Question	Answer	Marks	Partial Marks	Guidance
5(a)	$\frac{9}{50}$ oe	**1**		oe includes 0.18 and 18%. isw incorrect conversion after correct answer seen (9 is not an incorrect conversion). Do not allow the answer as a ratio or in words.
5(b)	36	**1**	FT *their* (a) × 200	0 ⩽ *their* (a) ⩽ 1 For the FT, allow a correctly rounded whole number or decimal, not an improper fraction.
6	12 20 [pm]	**3**	**B2** for 140 or 2 hr 20 mins or 12 20 am or **B1** for 140*k* or 2 × 2 × 5 × 7 or [20=] 2 × 2 × 5 and [35=] 7 × 5 or two correct factor trees/tables of both 20 and 35 OR **B2** for listing times/multiples of both 20 and 35 to at least 12 20 or 140 or **B1** for listing at least 3 of each or one full list	Allow B1 for 4 × 5 × 7 or [20 =] 4 × 5. Factor trees/tables for 20 can end at 4 and 5. Condone ×1 in factors or factor trees/tables. i.e. 3 multiples do not include 20, 35 and 10 00
7(a)	18.4 to 19.2	**2**	**B1** for 9.2 to 9.6 or **M1** for *their* 9.4 × 2	Tolerance is ±0.2 cm in the measurement and ±0.4 km in the answer. *their* 9.4 must be between 8.4 and 10.4.
7(b)	255 to 259	**1**		If answer line blank, award 1 for correct angle in the correct place on diagram.

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Question	Answer	Marks	Partial Marks	Guidance
8(a)	$-\frac{2}{3}$ oe	**2**	**M1** for $\frac{change\,in\,y}{change\,in\,x}$ or **SC1** for $\frac{2}{3}$ oe	Answer of $-\frac{2}{3}x$ oe implies M1. Condone answer written as a decimal correct to 3sf or better for 1 or 2 marks, i.e. 0.667 or 0.6666 to 0.6667; isw incorrect conversion from a correct fraction. Answer of $\frac{2}{-3}$ or $\frac{4}{-6}$ scores 2 marks.
8(b)	correct line at least from (0, −3) to (3, 3)	**2**	**M1** for line with gradient 2 or intercept $(0, -3)$	For accuracy, check that the line goes through $(0, -3)$ and (3, 3) and mark intention; condone good freehand and dashed lines for 1 and 2 marks. For M1 do not allow $y = -3$.
9(a)	0.0783	**1**		Condone trailing zeros after 3.
9(b)	1.1×10^4 cao	**2**	**B1** for 11×10^3 or 11 000 oe	Condone trailing zeros after 1.1.
10	$\begin{pmatrix}-3\\4\end{pmatrix}$	**1**		Do not accept with a fraction line.
11	8	**2**	**M1** for $\frac{360}{180-135}$ or for $\frac{180(n-2)}{n}=135$ oe	
12(a)(i)	Rotation 90 anticlockwise oe [centre =] (0,0)	**3**	**B1** for each	Do not allow turn, shift, spin, rot. If more than one transformation, award 0 marks. Extra properties treat as choice. Allow 270 clockwise, [+]90, –270. Allow acw, counter-clockwise. Condone *O*, 'origin', 0,0 and 'origin 0, 0'. Do not allow centre as a column vector but do not treat as an additional transformation.

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Question	Answer	Marks	Partial Marks	Guidance
12(a)(ii)	Enlargement –2 [centre =] (0, –2)	**3**	**B1** for each	Do not allow dilation or reduction. If more than one transformation, award 0 marks. Extra properties treat as choice. Condone 0, –2 or 'origin 0, –2' for centre. Do not accept centre given as a column vector but do not treat as an additional transformation.
12(b)(i)	correct triangle at (–2, –2), (–2, –4) and (–1, –4)	**1**		Mark intention, condone good freehand and dashed lines, ignore extra shapes if correct shape seen.
12(b)(ii)	correct triangle at (0, –1), (1, –1) and (1, 1)	**2**	**B1** for translation by $\begin{pmatrix}-1\\k\end{pmatrix}$ or $\begin{pmatrix}k\\3\end{pmatrix}$ on the grid	Mark intention, condone good freehand and dashed lines, ignore extra shapes if the 'correct' one for 1 or 2 marks seen.
13(a)	5	**2**	**M1** for $3^2 + 4^2$ soi or *AMO*/*BMO*/*ABC* = 90 seen or for $(\sqrt{6^2+8^2}) \div 2$	May be on diagram
13(b)	angle in a semicircle	**1**		Words in bold required: **angle subtended** [by a] **diameter** [=90] **angle** [in/on a] **semicircle** [=90] Do not allow: right-angled triangle in a semicircle Condone < for angle.
14	3 nfww	**2**	**M1** for $[r^3 =] \frac{3\times 36\pi}{4\pi}$ or better	better e.g. $[r^3 =] \frac{36}{\frac{4}{3}}$ or $\frac{108\pi}{4\pi}$

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0580/23 Mark Scheme June 2026

GradeMax

Question	Answer	Marks	Partial Marks	Guidance
15(a)	41	**1**		Correct answer could be on diagram in the correct place if answer line blank.
15(b)	53	**2**	**B1** for $ADC = 94$ or $BAC = 53$ or **M1** for $180 - 86 - 41$	Correct answer and B1 could be on diagram in the correct place especially if answer line blank.
16	25	**3**	**M2** for $y \times 4 = 20 \times 5$ oe OR **M1** for $y = \frac{k}{x}$ oe **M1** for $y = \frac{their\ k}{4}$ oe	oe e.g. $y = \frac{1}{kx}$ or $5 = \frac{k}{20}$
17(a)	22	**2**	**B1** for [+]16 or 6 or **M1** for $4 \times (-2)^2 + 2 \times 3$	Brackets must be present or recovered for $(-2)^2$. For the M1 mark, × can be omitted if brackets used correctly.
17(b)	$[x =] \frac{5y-6}{y-2}$ oe final answer	**4**	**M1** for $y(x-5) = 2(x-3)$ **M1** for correct expansion of both brackets **M1** for isolating x terms **M1** factorise and divide to final answer maximum 3 marks if final answer incorrect.	oe e.g. $[x =] \frac{6-5y}{2-y}$ scores 4 marks e.g. $yx - 5y = 2x - 6$ must be single brackets e.g. $yx - 2x = 5y - 6$ e.g. $x(y - 2) = 5y - 6$ then correct final answer
18(a)	$x^2 + 6x + 2x + 12 - \frac{1}{2}x^2 = 30$ oe unsimplified	**M2**	**M1** for $(x + 6)(x + 2) - \frac{1}{2}x^2$ [= 30] oe or for $x^2 + 6x + 2x + 12$ or for two correct areas	Accept equivalent area methods. two correct areas e.g. $6x + 12$ or $6(x + 2)$ allow $8x$ for $6x + 2x$ and $\frac{1}{2}x^2$ for $x^2 - \frac{1}{2}x^2$
	leading to $x^2 + 16x - 36 = 0$	**A1**	dep on M2 with no errors or omissions	

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0580/23 Mark Scheme June 2026

Question	Answer	Marks	Partial Marks	Guidance
18(b)	$(x + 18)(x – 2)$ and final answer 2	**3**	**B2** for $(x + 18)(x – 2)$ or **B1** for $(x + a)(x + b)$ where $ab = -36$ or $a + b = 16$ or partial factors $x(x – 2) + 18(x – 2)$ or $x(x + 18) – 2(x + 18)$ **B1** for final answer 2	If correct answer(s) and correct partial factorisation, award 3 marks. If factors and another method shown, both leading to the correct answer, award 3 marks. Note: answer 2 and –18 scores B0, and use of completing the square can only score B0 B1 if correct answer given.
19	$3\sqrt{3}$	**4**	**B3** for an equivalent expression OR **B1** for $\tan 60 = \sqrt{3}$ or $\tan 30 = \frac{1}{\sqrt{3}}$ or $\frac{\sqrt{3}}{3}$ **M2** for $\frac{9}{\tan 60}$ or $9 \tan 30$ or better or **M1** for $\tan 60 = \frac{9}{x}$ or $\tan 30 = \frac{x}{9}$ OR **B1** for $\sin 30 = \frac{1}{2}$ oe **and** $\sin 60 = \frac{\sqrt{3}}{2}$ **M2** for $\frac{9 \times \sin 30}{\sin 60}$ oe or **M1** for $\frac{\sin 30}{x} = \frac{\sin 60}{9}$ oe or better	e.g. B3 for $\frac{9}{\sqrt{3}}$, $9(\sqrt{3})^{-1}$ or $\frac{9\sqrt{3}}{3}$ e.g. for expressions where the value of tan 30 or tan 60 has been correctly substituted into the trigonometric expression, but do not pick from a table. M2 is for making x the subject. M1 only if x is within the expression and not the subject. e.g. $\frac{x}{\sin 30} = \frac{9}{\sin 60}$

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Question	Answer	Marks	Partial Marks	Guidance
20	8	**3**	**M2** for $h = \sqrt{\frac{80}{180}} \times 12$ oe or $\sqrt{\frac{80}{180} \times 12^2}$ or **M1** for $\sqrt{\frac{180}{80}}$ or $\sqrt{\frac{80}{180}}$ oe or better or $\left(\frac{12}{h}\right)^2 = \frac{180}{80}$ or $\left(\frac{h}{12}\right)^2 = \frac{80}{180}$ oe or better	Accept 144 for 12^2. e.g. M2 for $\frac{12}{3} \times 2$ oe oe e.g. M1 for $\frac{3}{2}$ or $\frac{2}{3}$ Note: an answer of 5.33… indicates the use of the figures as a linear scale factor.
21(a)	0.1 or $\frac{1}{10}$	**1**		Note: e.g. −0.1 and ± 0.1 score 0.
21(b)	$4 + 2\sqrt{2}$ cao	**3**	**B2** for $\frac{8 + 4\sqrt{2}}{2}$ oe OR **M1** for $\frac{4}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}}$ oe **M1** for $4 + 2\sqrt{2} - 2\sqrt{2} - 2$ or better	Accept correct simplified equivalent for 3 marks: $2(2 + \sqrt{2})$. B2 e.g. $\frac{4\left(2+\sqrt{2}\right)}{2}$, $\frac{-8-4\sqrt{2}}{-2}$, $\frac{4+2\sqrt{2}}{1}$ oe e.g. $\frac{4}{2-\sqrt{2}} \times \frac{-2-\sqrt{2}}{-2-\sqrt{2}}$ then M1 for $-4 - 2\sqrt{2} + 2\sqrt{2} + 2$ or better If fraction line missing in $\frac{2+\sqrt{2}}{2+\sqrt{2}}$ then brackets are required, e.g. $\frac{4}{2-\sqrt{2}} \times \frac{(2+\sqrt{2})}{(2+\sqrt{2})}$

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Question	Answer	Marks	Partial Marks	Guidance
22(a)(i)	$\frac{1}{1000}b^{-12}$ or $\frac{1}{1000b^{12}}$ final answer	**2**	**B1** for $\frac{1}{1000}b^{k}$, $\frac{1}{kb^{12}}$ or kb^{-12} oe (where $k \neq 0$) as final answer or for correct answer seen then spoilt	Accept 0.001 for $\frac{1}{1000}$ for 1 or 2 marks.
22(a)(ii)	$4p^{10}$ final answer	**2**	**B1** for $4p^{k}$ or kp^{10} (where $k \neq 0$) as final answer or for correct answer seen then spoilt	Answer $\pm 4p^{10}$ scores B1.
22(b)	$\frac{3}{2}$ oe	**2**	**M1** for $4^{2n} = 4^3$ or $16^n = 16^{3/2}$ or $2^{4n} = 2^6$ or $(16^{\frac{1}{2}})^3$ or for equating *their* powers with a common base	Condone e.g. $(4^2)^n = 4^3$.
23	31π final answer	**3**	**M2** for $\pi \times 6^2 \times \frac{360-50}{360}$ oe or **M1** for $\frac{50}{360} \times \pi \times 6^2$ oe if 0 scored **SC1** for $\frac{310}{360} \times k\pi$	If 31π seen then answer given as a decimal, e.g. 97.389…, award M2 only.
24	$\frac{2x^2+2x+13}{(x+3)(x-2)}$ or $\frac{2x^2+2x+13}{x^2+x-6}$ final answer	**4**	**B1** for common denominator $(x + 3)(x – 2)$ oe **B1** for $(x – 2)(x – 2) + (x + 3)(x + 3)$ or better seen **B1** for $x^2 – 2x – 2x + 4$ or $x^2 + 3x + 3x + 9$ or better seen	for all B marks, ignore subsequent cancelling and accept in two separate fractions with a common denominator. Allow recovery if brackets omitted. oe e.g. or $x^2 + 3x – 2x – 6$ oe isw Third B1 may be picked from a long expression or implied by correct numerator.

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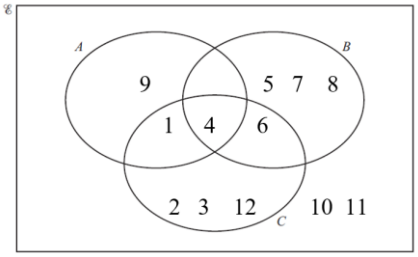
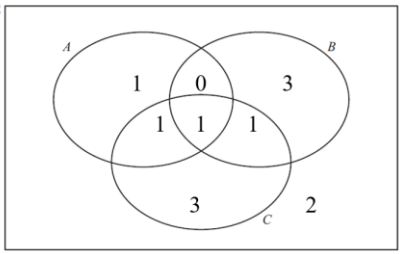
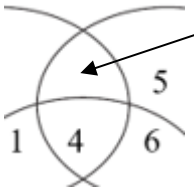
Question	Answer	Marks	Partial Marks	Guidance
25(a)	correct diagram for elements  or correct diagram for number of elements  	**3**	**B2** for 4 correct regions (from 8 regions) or **B1** for 2 correct regions	
25(b)	0	**1**	FT *their* diagram from this region  	Nil or zero scores 1. ∅ or empty set scores 0.

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Question	Answer	Marks	Partial Marks	Guidance
26(a)	$3(x-1)^2+2$ final answer	**3**	**M1** for $[3](x^2-2x+k)$ or $[3](x^2-2x)+k$ oe soi **B1** for $(x-1)^2$ seen OR **B2** for two of $a=3$, $b=-1$ or $c=2$ correct in *their* final answer or **B1** for $a=3$ in *their* final answer	Note: $3(x+-1)^2+2$ scores 3
26(b)	(1, 2)	**1**	FT *their* (a) provided in correct form	FT *their* $[a](x+b)^2+c$ with answer $(-b, c)$
27	$\frac{62}{90}$ oe	**4**	**M3** for $1-\left(\frac{5}{10}\times\frac{4}{9}+\frac{3}{10}\times\frac{2}{9}+\frac{2}{10}\times\frac{1}{9}\right)$ oe or **M2** for $\frac{5}{10}\times\frac{4}{9}+\frac{3}{10}\times\frac{2}{9}+\frac{2}{10}\times\frac{1}{9}$ oe or **M1** for $\frac{k}{10}\times\frac{c}{9}$ OR **M3** for $\frac{5}{10}\times\frac{5}{9}+\frac{3}{10}\times\frac{7}{9}+\frac{2}{10}\times\frac{8}{9}$ oe or **M2** for two of these products added oe or **M1** for $\frac{k}{10}\times\frac{c}{9}$ If 0 scored, **SC1** for $\frac{62}{100}$ oe	Accept fraction, percentage, decimal equivalents (3sf or better), e.g. 0.689, 0.6888 to 0.6889. oe e.g. M3 implied by $1-\frac{28}{90}$ and M2 implied by $\frac{28}{90}$ M3 for any correct alternative, e.g. $\frac{2}{10}\times\frac{3}{9}+\frac{2}{10}\times\frac{5}{9}+\frac{3}{10}\times\frac{2}{9}+\frac{3}{10}\times\frac{5}{9}+\frac{5}{10}\times\frac{2}{9}+\frac{5}{10}\times\frac{3}{9}$ oe M2 for four of these products added i.e. correct answer evaluated with replacement Ignore incorrect cancelling or conversion following a correct answer, but not ratio.

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0580/23 Mark Scheme June 2026

GradeMax

Question	Answer	Marks	Partial Marks	Guidance
28	$\frac{5}{7}\mathbf{r} + \frac{2}{7}\mathbf{s}$ final answer	**3**	**B2** for unsimplified correct answer or $\overrightarrow{RP} = \frac{2}{7}(\mathbf{s} - \mathbf{r})$ soi or $\overrightarrow{SP} = \frac{5}{7}(\mathbf{r} - \mathbf{s})$ soi or **B1** for correct route for OP or for $\overrightarrow{RS} = \mathbf{s} - \mathbf{r}$ or $\overrightarrow{SR} = \mathbf{r} - \mathbf{s}$	Accept equivalent simplified expressions for 3 marks, e.g. $\frac{1}{7}(2\mathbf{s} + 5\mathbf{r})$, $\frac{2\mathbf{s}+5\mathbf{r}}{7}$ Ignore lines or arrows over the vectors. e.g. $OR + RP$ or $\mathbf{r} + RP$

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