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# GCSE

# MATHEMATICS

**New Specimen Papers published June 2015**  
Paper 2 Foundation - Mark Scheme

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8300/2F

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Version 1.0

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Principal Examiners have prepared these mark schemes for specimen papers. These mark schemes have not, therefore, been through the normal process of standardising that would take place for live papers.

Further copies of this Mark Scheme are available from [aqa.org.uk](http://aqa.org.uk)

## Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

<b>M</b>	Method marks are awarded for a correct method which could lead to a correct answer.
<b>A</b>	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
<b>B</b>	Marks awarded independent of method.
<b>ft</b>	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
<b>SC</b>	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
<b>M dep</b>	A method mark dependent on a previous method mark being awarded.
<b>B dep</b>	A mark that can only be awarded if a previous independent mark has been awarded.
<b>oe</b>	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
<b>[a, b]</b>	Accept values between <i>a</i> and <i>b</i> inclusive.
<b>3.14...</b>	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
<b>Use of brackets</b>	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

### **Diagrams**

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

### **Responses which appear to come from incorrect methods**

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

### **Questions which ask students to show working**

Instructions on marking will be given but usually marks are not awarded to students who show no working.

### **Questions which do not ask students to show working**

As a general principle, a correct response is awarded full marks.

### **Misread or miscopy**

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

### **Further work**

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

### **Choice**

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

### **Work not replaced**

Erased or crossed out work that is still legible should be marked.

### **Work replaced**

Erased or crossed out work that has been replaced is not awarded marks.

### **Premature approximation**

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q	Answer	Mark	Comments
1	26	B1	
2	4	B1	
3	-7.4	B1	
4	D	B1	
5	[8.4, 8.8] ( $\times 2.5$ )	M1	
	[21, 22]	A1	SC1 Any given length in cm correctly multiplied by 2.5
6	<b>Alternative method 1</b>		
	100 – 40 – 28 or 32	M1	
	their 32 $\div$ 100 $\times$ 275	M1dep	oe 0.32 $\times$ 275 scores M2
	88	A1	
	<b>Alternative method 2</b>		
	40 $\div$ 100 $\times$ 275 or 110 or 28 $\div$ 100 $\times$ 275 or 77	M1	oe
	275 – their 110 – their 77	M1dep	
88	A1		
7(a)	Yes, gives correct answer as inverse operations and order does not matter	B1	oe
7(b)	No, does not work, inverse operations not in correct order	B1	oe

Q	Answer	Mark	Comments
8(a)	$5w = 24 + 11$ or $5w = 35$	M1	oe $35 \div 5$
	7	A1	
8(b)	$15x + 12y$ or $12y + 15x$	B1	
8(c)	$2x + y^2$ or $y^2 + 2x$	B1	
9	No and shows an example of an even multiple of 3 + a multiple of 2 = an even number	B1	eg No and $6 + 4 = 10$
10	<b>Alternative method 1</b>		
	$24 \times 48 \times 9.2$ or 10598.4(0)	M1	
	10598.4(0) and Yes	A1	
	<b>Alternative method 2</b>		
	$10\ 000 \div 24 \div 48$ or 8.6(8...) or 8.7	M1	
	8.6(8...) or 8.7 and Yes	A1	
	<b>Alternative method 3</b>		
	$10\ 000 \div 24 \div 9.2$ or 45.(...) or 46	M1	
	45.(...) or 46 and Yes	A1	
	<b>Alternative method 4</b>		
	$10\ 000 \div 48 \div 9.2$ or 22.(...) or 23	M1	
	22.(...) or 23 and Yes	A1	

Q	Answer	Mark	Comments
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11	62 – 34 or 28	M1	Box C
	their 28 – 9 or 19 or their 28 + 9 or 37	M1	Box A
	(A =) 19, (B =) 15, (C =) 28	A1	SC2 for their A + their B = 34 and their A – their C = ±9 SC1 for their A + their B = 34 or their A – their C = ±9

12(a)	<b>Alternative method 1</b>		
	360 – 171 or 189	M1	
	their 189 ÷ 3 or 63	M1dep	
	$\frac{63}{360} \times 800 (= 140)$	A1	
	<b>Alternative method 2</b>		
	$\frac{171}{360} \times 800$ or 380	M1	
	(800 – their 380) or 420	M1dep	
	420 ÷ 3 (= 140)	A1	
	<b>Alternative method 3</b>		
	140 + 280 or 420°	M1	
	$\frac{\text{their } 420}{800} \times 360$ or 189	M1	oe
	360 – 189 = 171	A1	

Q	Answer	Mark	Comments
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<b>12(b)</b>	Bar heights 380, 280 and 140	B2	B1 for one correct bar height or 280 seen or 380 seen
	Three bars with equal widths, equal gaps and correctly labelled vertical axis and bars labelled	B1	
	Consistent scale, starting at zero with at least two numbers given	B1	Must be using a scale of at least 1 cm per 100 sales

<b>13(a)</b>	$1000 \div 42$ or $23.8(\dots)$ or $23\frac{17}{21}$ or $\frac{500}{21}$	M1	
	23	A1	
<b>13(b)</b>	34	B1ft	ft their answer to (a)

Q	Answer	Mark	Comments
14	<b>Alternative method 1</b>		
	$1700 \div (10 + 10 + 10 + 20)$ or $1700 \div 50$ or $50x = 1700$ or 34	M1	oe
	3 × their 34	M1dep	
	102	A1	
	<b>Alternative method 2</b>		
	Ratio 30 : 20 seen or implied	M1	oe
	$1700 \div 5 \times 3$ or 1020 or $1700 \div 5 \times 2$ or 680	M1dep	oe
	102	A1	
	<b>Alternative method 3</b>		
	Chooses 10p and 20p coins in the ratio 3 : 1 and works out their total value	M1	
	Builds up to £10.20 and £6.80	M1dep	
	102	A1	



Q	Answer	Mark	Comments
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15(a)	12	B1	
15(b)	7 × 9 or 63 or $12 + \frac{27}{4} \times 6$ or (£)52.5(0)	M1	
	63 or (£)52.5(0) and No	A1	
15(c)	$a = 9$	B1	
	Substitutes a correct pair of values for $n$ and $C$ into $C = 9 + b(n - 1)$ or method for gradient eg $\frac{41 - 9}{5 - 1}$	M1	oe
	$b = 8$	A1	

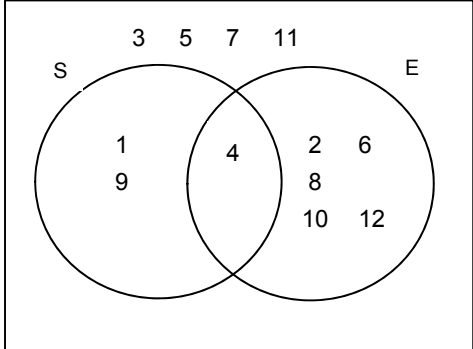
16	Sketch of possible pentagon with exactly one line of symmetry, integer sides labelled, perimeter 15 cm ie  $1 \times 7$ cm and $4 \times 2$ cm $1 \times 7$ cm and $2 \times 3$ cm and $2 \times 1$ cm $1 \times 5$ cm and $2 \times 4$ cm and $2 \times 1$ cm $1 \times 5$ cm and $2 \times 3$ cm and $2 \times 2$ cm $1 \times 3$ cm and $2 \times 5$ cm and $2 \times 1$ cm $1 \times 3$ cm and $2 \times 4$ cm and $2 \times 2$ cm $3 \times 1$ cm and $2 \times 6$ cm $1 \times 1$ cm and $2 \times 5$ cm and $2 \times 2$ cm $1 \times 1$ cm and $2 \times 4$ cm and $2 \times 3$ cm $5 \times 3$ cm (but sketch clearly only has 1 line of symmetry)	B2	B1 regular pentagon with $5 \times 3$ cm labelled or (impossible) pentagon with sides labelled eg $1 \times 11$ cm and $4 \times 1$ cm or pentagon with one line of symmetry and non-integer sides labelled, perimeter 15 Units not needed
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Q	Answer	Mark	Comments
17	<b>Alternative method 1</b>		
	$5 \times 24.2$ or 121 (miles)	M1	
	their $121 \div 32.3$ or [3.74, 3.75] (gallons)	M1	
	their [3.74, 3.75] $\times 4.5$ or [16.8, 16.9] (litres)	M1	
	their [16.8, 16.9] $\times 1.27$	M1	
	[21.33, 21.47] and bus	A1	Accept 21 and bus if working shown
	<b>Alternative method 2</b>		
	$5 \times 24.2$ or 121 (miles)	M1	
	their $121 \div 32.3$ or [3.74, 3.75] (gallons)	M1	
	1.27 $\times 4.5$ or 5.71(5) or 5.72	M1	
	their [3.74, 3.75] $\times$ their 5.71(5)	M1	
	[21.33, 21.47] and bus	A1	Accept 21 and bus if working shown

**Alternative methods 3 and 4 on next page**

Q	Answer	Mark	Comments
17	<b>Alternative method 3</b>		
	19.50 ÷ 5 or 3.9(0)	M1	
	24.2 ÷ 32.3 or [0.74, 0.75] (gallons)	M1	
	their [0.74, 0.75] × 4.5 or [3.3, 3.4] (litres)	M1	
	their [3.3, 3.4] × 1.27	M1	
	[4.19, 4.32] and 3.9(0) and bus	A1	Accept 4 and 3.9(0) and bus if working shown
	<b>Alternative method 4</b>		
	19.50 ÷ 5 or 3.9(0)	M1	
	24.2 ÷ 32.3 or [0.74, 0.75] (gallons)	M1	
	1.27 × 4.5 or 5.71(5) or 5.72	M1	£ per gallon
	their [0.74, 0.75] × their 5.71(5)	M1	
	[4.19, 4.32] and 3.9(0) and bus	A1	Accept 4 and 3.9(0) and bus if working shown

Q	Answer	Mark	Comments
18	$7x - 4$ or $3x + 2$	M1	
	$7x - 4 = 3(3x + 2)$ or $7x - 4 = 9x + 6$	M1	
	$7x - 9x = 6 + 4$ or $-2x = 10$ or $-4 - 6 = 9x - 7x$ or $-10 = 2x$	M1	oe Collecting like terms
	-5	A1	
19	$10\,000 \div 400 = 25$ or $400 \times 25 = 10\,000$ or $10\,000 \div 25 = 400$	B1	
	Ticks 'No, the time will be longer' and gives correct explanation	B1	oe eg He won't be able to run 10 km at same speed/rate/pace as he runs 400 m
20	1 2 4 8	B1	
21	$12.9 \times 12.9$ or 166.41	M1	
	$\frac{1}{3} \times$ their $166.41 \times 17.4$	M1	
	965.178 or 965.18 or 965.2 or 965	A1	

Q	Answer	Mark	Comments
22(a)		B3	B2 Any 2 or 3 of the 4 sections correct B1 Any 1 of the 4 sections correct
22(b)	$\frac{1}{12}$	B1ft	oe ft their Venn diagram
23(a)	Two of $\frac{6}{50}$ $\frac{28}{100}$ $\frac{34}{150}$	B2	oe fraction, decimal, percentage B1 One of $\frac{6}{50}$ $\frac{28}{100}$ $\frac{34}{150}$ with at most one incorrect answer
23(b)	Chooses their probability from the larger number of trials and reason given that more trials are involved	B1ft	Must have two probabilities in (a)
24	$\frac{4}{5}$ or 80% seen or used	M1	oe May be implied
	29.4(0) $\times$ 5 $\div$ 4 or 147 $\div$ 4 or 29.4(0) $\div$ 4 ( $\times$ 5) or 7.35 ( $\times$ 5) or 29.4(0) $\div$ 0.8	M1	oe
	36.75	A1	
25	AAA	B1	

Q	Answer	Mark	Comments
26	<b>Alternative method 1</b>		
	6 and 10 seen	M1	
	(their 6) <sup>2</sup> + (their 10) <sup>2</sup> or 136	M1dep	
	[11.66, 11.7] or $\sqrt{136}$ or $2\sqrt{34}$	A1	
	<b>Alternative method 2</b>		
	$12^2 + 20^2$ or 544	M1	
	$\sqrt{\text{their } 544}$ or $4\sqrt{34}$ or [23.32, 23.324]	M1dep	
	[11.66, 11.7] or $\frac{\sqrt{544}}{2}$ or $\sqrt{136}$ or $2\sqrt{34}$	A1	
27	$y = 5x + 2$	B1	
28	<b>Alternative method 1</b>		
	2 parts $\rightarrow$ 116	M1	oe
	$116 \div 2 \times 16$	M1	oe
	928	A1	
	<b>Alternative method 2</b>		
	Writes at least 3 ratios or numbers of boys and girls equivalent to 9 : 7	M1	eg 18 : 14 and 180 : 140 and 360 : 280
	522 and 406	M1	
	928	A1	
29	$(x - 4)(x + 8) = 0$	B1	

Q	Answer	Mark	Comments
<b>30</b>	<b>Alternative method 1</b>		
	$10 \div 4$ or 2.5 or $4 \div 10$ or 0.4 or $\frac{1}{2} \times (18 + 10) \times 25$ or 350	M1	oe
	$18 \div$ their 2.5 or $18 \times$ their 0.4 or 7.2 or $25 \div$ their 2.5 or $25 \times$ their 0.4 or 10	M1dep	oe
	$\frac{1}{2} \times (18 + 10) \times 25$ or 350 and $\frac{1}{2} \times (\text{their } 7.2 + 4) \times \text{their } 10$ or 56	M1dep	Must see working
	$350 - 56 = 294$	A1	Do not award without working seen
	<b>Alternative method 2</b>		
	$10 \div 4$ or 2.5 or $4 \div 10$ or 0.4 or $\frac{1}{2} \times (18 + 10) \times 25$ or 350	M1	oe
	(Area scale factor =) (their 2.5) <sup>2</sup> or (their 0.4) <sup>2</sup>	M1dep	
	their $350 \div$ (their 2.5) <sup>2</sup> or their $350 \times$ (their 0.4) <sup>2</sup> or 56	M1dep	Must see working
	$350 - 56 = 294$	A1	Do not award without working seen

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