GCSE
MATHEMATICS

Practice Papers Set 4
Paper 1 Higher - Mark Scheme

8300/1H

Version 1.0

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

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.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	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	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
[*a*, *b*)	Accept values $a \leq$ value $< b$
3.14 …	Allow answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	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.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the candidate intended it to be a decimal point.

Q	Answer	Mark	Comments
1(a)	$4xy$	B1	
	Additional Guidance		
1(b)	$8x^2y^3$	B1	
	Additional Guidance		
2	45°	B1	
	Additional Guidance		
3	$-\frac{3}{4}$	B1	
	Additional Guidance		
4	$(\frac{1}{2}) \times \pi \times 6 \times 6$	M1	oe
	$(\frac{1}{2}) \times \pi \times 6 \times 6 \div 4$	M1dep	oe
	4.5π	A1	oe
	Additional Guidance		

Q	Answer	Mark	Comments
5(a)	20 – 3 minutes 40 seconds	M1	oe
	16 minutes 20 seconds	A1	
	Additional Guidance		
5(b)	Valid reason	B1	eg Median is in $10 < t \square 15$ class (so does not include 10 minutes)
	Additional Guidance		
6	Line *AB* extended and two equal intersecting construction arcs from *B* or Arc from *B* cutting *AB* and two intersections with this arc above *B*	M1	
	Perpendicular drawn from *B* with all construction arcs seen	A1	
	Fully correct triangle with $AC = 9$ cm and angle $B = 90°$	A1	tolerance ± 0.1 cm SC1 for correct triangle without construction arcs
	Additional Guidance		
7(a)	$\frac{2}{17}$	B1	
	Additional Guidance		
7(b)	$\frac{1}{17}$	B1	
	Additional Guidance		

Q	Answer	Mark	Comments
8	–3.5 seen	M1	oe
	–9, –8, –7, –6, –5, –4	A1	Any order
	Additional Guidance		
9	–72	B1	
	0	B1	
	Additional Guidance		
10(a)	3 0 3	B2	B1 for 1 or 2 correct
	Additional Guidance		
10(b)	4 or 5 of their points plotted correctly	M1	
	Fully correct smooth curve	A1	
	Additional Guidance		
10(c)	(1, –1)	B1	
	Additional Guidance		

Q	Answer	Mark	Comments
11(a)	5.15	B1	
	5.25	B1	
	Additional Guidance		
11(b)	20.6	B1ft	ft 4 × their 5.15
	21	B1ft	ft 4 × their 5.25
	Additional Guidance		
12(a)	$2w - 3 = 24$	M1	
	$2w = 24 + 3$ or $2w = 27$	M1dep	
	13.5	A1	oe
	Additional Guidance		
12(b)	$x^2 - \frac{25}{4} < 0$ or $4x^2 < 25$ or $(2x - 5)(2x + 5) < 0$	M1	
	$x^2 < \frac{25}{4}$ or 2.5 or –2.5 seen	M1dep	
	$-2.5 < x < 2.5$	A1	oe
	Additional Guidance		

Q	Answer	Mark	Comments
12(c)	$1 = 5(y - 6)$ or $1 = 5y - 30$	M1	
	$1 + 30 = 5y$ or $31 = 5y$ or $\frac{1}{5} = y - 6$	M1dep	
	$\frac{31}{5}$	A1	oe
	Additional Guidance		
13(a)	$\frac{1}{2}$	B1	
	Additional Guidance		
13(b)	$(b^2 =) 5^2 + 8^2 - 2 \times 5 \times 8 \times \cos 60$	M1	
	$(b^2 =) 25 + 64 - 40$	M1dep	
	$b^2 = 49$ so $b = 7$	A1	
	Additional Guidance		

Q	Answer	Mark	Comments
14	Works out cost of buying same amount so two of the three offers can be compared or £1.60 for 3 single tins	M1	eg 6 single tins = 80p × 4 = £3.20
	Works out cost of buying same amount so all three offers can be compared	M1	12 single tins = 80p × 8 = £6.40
	Works out one way of buying 21 tins	M1	eg 14 × 80p = £11.20 (21 singles) £5.50 + £3.50 + 2 × 80p = £10.60 (One pack of 12, one of 6 and 3 singles) £5 + £3.50 + 2 × 80p = £10.10 (Three packs of 6 and 3 singles) £5 + 6 × 80p = £9.80 (Two packs of 6 and 9 singles)
	Correct combination for 21 tins and £9.80	A1	ie Two packs of 6 and 9 singles
	Additional Guidance		

15(a)	15 or 16	M1	Reading off at 30
	$\frac{45}{60}$ or $\frac{44}{60}$	A1	oe
	Additional Guidance		

15(b)	[69, 70]	B1	
	Additional Guidance		

Q	Answer	Mark	Comments
15(c)	No and comparative reason	B2	eg No and median is 19 so lower No and nobody scored higher than 77 on Quiz 2 but the maximum score on Quiz 1 was 98 B1 for No and partial reason eg No someone scored less than 10 No the top score was only 77
	Additional Guidance		
	The range is lower on Quiz 2		B0

16	**Alternative method 1**		
	1 part = 6 bricks	M1	oe
	36 (yellow, blue and green)	A1	
	12 (red)	B1	
	36 + 12 = 48	B1	
	Alternative method 2		
	12 (red)	B1	
	36 ÷ 6 or 6	M1	
	their 6 × 2	M1dep	
	12 (yellow)	A1	
	Alternative method 3		
	6 parts = 75%	M1	
	8 parts = 100%	A1	
	1 part = 6 bricks	B1	
	8 × 6 = 48	B1	
	Additional Guidance		

Q	Answer	Mark	Comments
17(a)	$\frac{1}{64}$	B1	
	Additional Guidance		
17(b)	2^2 or $64^{\frac{1}{3}}$ or $\sqrt[3]{64}$ or $\left(\sqrt[3]{64}\right)^2$	M1	
	4	A1	
	1	A1	
	Additional Guidance		
17(c)	1 seen or implied	M1	
	$\sqrt{12}$	A1	
	$2\sqrt{3}$	A1	
	Additional Guidance		
18	½ × 10 × 45 or [200, 225) or ½ × 5 × 30 + ½ × (30 + 45) × 5 or 75 + 187.5	M1	oe
	[225, 275]	A1	
	Additional Guidance		

Q	Answer	Mark	Comments
19	$\frac{1}{2} \times 6x \times 8y \times \frac{1}{3}$ or $8xy$	M1	oe
	$\frac{1}{2} \times 3x \times (4x + 10x)$ or $21x^2$	M1	oe
	$8xy = 21x^2$	M1	oe
	$y = \frac{21x}{8}$	A1	oe
	Additional Guidance		
20(a)	$\frac{2}{6}$ or $\frac{1}{3}$ seen	M1	oe
	$\frac{2}{6} \times \frac{1}{5}$	M1dep	oe
	$\frac{1}{15}$	A1	oe
	Additional Guidance		
20(b)	Probability is now bigger	B1	
	Valid working or statement to support answer	B1	eg $\frac{1}{3}$ is greater than $\frac{1}{5}$ oe $\frac{1}{9}$ is greater than $\frac{1}{15}$ oe
	Additional Guidance		
21	$\frac{36}{99}$ and $\frac{4}{11}$	B1	
	Additional Guidance		

Q	Answer	Mark	Comments
22	$2(x + 5)^2$	B1	
	Additional Guidance		

23	**Alternative method 1**		
	$6^2 - 4^2$ or $\sqrt{6^2 - 4^2}$	M1	oe
	$\sqrt{20}$ or $2\sqrt{5}$	A1	
	$(\sqrt{20} - 4)^2$ or $(2\sqrt{5} - 4)^2$	M1	oe
	$20 - 8\sqrt{20} + 16$ or $20 - 16\sqrt{5} + 16$	M1dep	oe
	$36 - 8\sqrt{20}$ or $4(9 - 2\sqrt{20})$ or $2(18 - 4\sqrt{20})$ or $2(18 - 8\sqrt{5})$	A1	oe
	$36 - 16\sqrt{5}$ or $4(9 - 4\sqrt{5})$	A1	

Alternative method 2 on next page

Q	Answer	Mark	Comments

23	**Alternative method 2**		
	$6^2 - 4^2$ or $\sqrt{6^2 - 4^2}$	M1	oe
	$\sqrt{20}$ or $2\sqrt{5}$	A1	
	$\frac{1}{2} \times \sqrt{20} \times 4$ or $2\sqrt{20}$ or $4\sqrt{5}$	M1	oe
	$4 \times \frac{1}{2} \times \sqrt{20} \times 4$ or $4 \times 2\sqrt{20}$ or $4 \times 4\sqrt{5}$ or $8\sqrt{20}$ or $16\sqrt{5}$	M1dep	oe
	$36 - 8\sqrt{20}$ or $4(9 - 2\sqrt{20})$ or $2(18 - 4\sqrt{20})$ or $2(18 - 8\sqrt{5})$	A1	oe
	$36 - 16\sqrt{5}$ or $4(9 - 4\sqrt{5})$	A1	
	Additional Guidance		

SP/10/16