GCSE
MATHEMATICS

NEW PRACTICE PAPER SET 1 Higher Tier Paper 2
Mark Scheme (Published September 2015)

8300/2H

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.
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

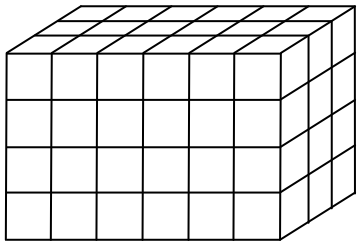
Erased or crossed out work that is still legible should be marked.

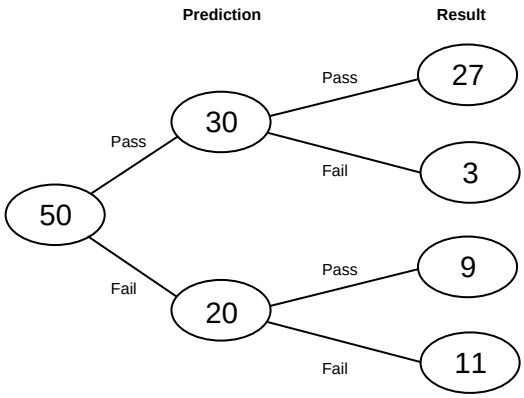
Work replaced

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.

Q	Answer	Mark	Comments
1	mass ÷ volume	B1	
2	$\frac{19}{8}$	B1	
3	$y = 0$	B1	
4	Kite	B1	
5	3, 4 and 6 chosen	M1	May be implied from a diagram 
	72	A1	
6(a)	$2 \leqslant t < 4$	B1	
6(b)	**Alternative method 1**		
	32 + 19 + 20 or 71 and 80 × 0.9 or (32 + 19 + 20) ÷ 80 × 100 or 88.75	M1	oe
	71 and 72 and No or 88(.75)(%) or 89(%) and No	A1	Accept 88(.75)(%) and Yes because it rounds to 90
	Alternative method 2		
	7 + 2 or 9 and 80 × 0.1 or (7 + 2) ÷ 80 × 100 or 11.25	M1	oe
	9 and 8 and No or 11(.25)(%) or 12(%) and No	A1	

Q	Answer	Mark	Comments
7	36 ÷ 4	M1	
	9 and 27	A1	
	Fully correct 	A1	
8	7 and 75	B1	
	their 7 × 12 + their 75 × 1.50 or 84 + 112.50 or 196.50	M1	
	their 196.50 + 163 or 359.50	M1	
	their 359.50 × 2 or 719	M1	
	their 719 – their 7 – their 75	M1	
	637	A1	
9	2 (×) 140 or 5 (×) 56 or 7 (×) 40	M1	oe Correct product with at least one prime factor
	2 × 2 × 2 × 5 × 7	A1	oe
10	$y^2 - 4y + 5y - 20$	M1	Allow 1 error
	$y^2 + y - 20$	A1	

Q	Answer	Mark	Comments
11(a)	$\cos x = \frac{8}{11}$ or $\sin x = \frac{\sqrt{11^2 - 8^2}}{11}$ or $\tan x = \frac{\sqrt{11^2 - 8^2}}{8}$	M1	oe
	43(.3 ….)	A1	
11(b)	$\tan 40 = \frac{y}{37}$ or $\tan 50 = \frac{37}{y}$	M1	oe $x = 48.3\ldots$ and $37^2 + y^2 = 48.3^2$ 48.3 cos 50 or 48.3 sin 40
	31. (…)	A1	
12	$\pi \times 40^2 \times 150$	M1	753982 or 240000π [753600, 754080]
	their 753 982 ÷ 1000 or their 753 982 ÷ 1000 ÷ 0.2	M1	753.982 or 240π [753.600, 754.080] 3770 [3768, 3770.4]
	their 3770 ÷ 60 (÷ 60) or (60 × 60 =) 3600 or 0.2 × 60 × 60 or 720	M1dep	62.83… or 1.04… [62.8, 62.84] or [1.04, 1.05]
	[62.8, 62.84] and Yes or [1.04, 1.05] and Yes or 3600 and 3770 and Yes or 753.9 and 720 and Yes	A1	oe
13	all	B1	

Q	Answer	Mark	Comments
14	130% = £2.34 or 2.34 ÷ 1.3 or (£)1.8(0)	M1	oe
	their (£)1.8(0) × 1.4	M1dep	
	2.52	A1	
15	3, 0 and –1	B3	Any order B1 for each
16	Gradient is 5	B1	Implied by $y = 5x\ldots$
	their $5 \times -2 + c = -4$	M1	
	$y = 5x + 6$ or $5x - y + 6 = 0$ or $y - 5x - 6 = 0$	A1 ft	ft their gradient
17	Bars should not be of equal width or horizontal scale is incorrect	B1	oe
	Vertical axis should be frequency density or heights of bars incorrect	B1	oe

Q	Answer	Mark	Comments
18(a)	Fully correct cf diagram using UCBs and 9, 44, 74, 92, 100 (100, 9) (120, 44) (140, 74) (160, 92) (180, 100)	B3	Ignore (80, 0) Ignore before 1st point and after last point B2 for one error eg constant plotting at mid class intervals with line joining points consistent plotting at lower bounds with line joining points One error on cf values eg 9, 45, 75, 93, 101 9, 44, 75, 92, 100 Points not joined B1 for 9, 44, 74, 92, 100 or for bar chart indicated correct heights with no lines
18(b)	Reads off at 150	B1ft	ft their curve Must be increasing $\pm\frac{1}{2}$ square tolerance
19(a)	$w = 3.5y$ or $w = ky$ and $k = 3.5$	M1	oe
	31.5	A1	
19(b)	$w \propto \frac{1}{x^2}$ or $w = \frac{k}{x^2}$	M1	oe
	$5 = \frac{k}{2^2}$ or $k = 20$ or $w = \frac{20}{x^2}$	M1dep	oe
	0.2	A1	oe
19(c)	D	B1	

Q	Answer	Mark	Comments
20(a)	$\frac{2 \times 1^3 + 8}{3 \times 1^2 + 5}$ or 1.25	M1	
	Substitutes their answer for x or 1.2290 ….	M1	
	(1.25 and 1.2290 and 1.2289 and answer) 1.2289	A1	Accept unrounded values for all but answer
20(b)	0.00037….	B1ft	ft their answer to (a)
	Good approximation as the result is close to 0	B1ft	ft the result of their calculation
21	Angle $BCD = 2x$	M1	Opposite angles of parallelogram are equal
	Angle $FCE = 360 - 90 - 90 - 2x$ or Angle $FCE = 180 - 2x$	M1	oe Angles at a point sum to 360°
	Angle $CFE = y$ or Angle $FCE = 180 - 2y$	M1	oe eg $2y + FCE = 180$ Isosceles triangle
	$180 - 2x + y + y = 180$	M1	oe Angles in a triangle sum to 180°
	$2y = 2x$ $y = x$	A1	All reasons **must** be stated

Q	Answer	Mark	Comments
22	$x(x - 15) + x + x - 2 + 32 = 120$	M1	
	$x^2 - 13x - 90 = 0$	A1	
	$(x - 18)(x + 5) = 0$	M1	oe $(x + a)(x + b)$ where $ab = -90$ and $a + b = -13$
	their 18 + their 18 – 2 or 34	M1	
	$\frac{18}{34}$	A1	oe SC2 for $\frac{x}{2x - 2}$
23(a)	Draws a tangent at $t = 6$	B1	
	$\frac{\text{change in speed}}{\text{change in time}}$ for their tangent	M1	
	Correct answer for their tangent	A1ft	
23(b)	Attempts to work out area below straight lines	M1	eg 4×12 or 48 and $\frac{1}{2} \times 6 \times 12$ or 36
	Attempts to work out estimate of area under the curve	M1	eg $\frac{1}{2} \times 14 \times 12$ or 84 $\frac{1}{2} \times 14 \times (4 + 12)$ or 112
	their total distance ÷ 24	M1	
	Their answer worked out correctly with no errors in area below straight lines	A1	Their area must be in the range [168, 196]
23(c)	Correct box ticked with suitable comment	B1ft	ft their answer to part (b) eg their (b) 168 Underestimate ticked and triangle less than area under curve their (b) 196 Overestimate ticked and trapezium more than area under curve

Q	Answer	Mark	Comments
24	$(w + 5)(w - 5)$	B1	
	$(w + 1)(w + 2)$	B1	
	$(3w + a)(w + b)$	M1	$ab = 5$ or $a + 3b = -16$
	$(3w - 1)(w - 5)$	A1	
	$\frac{6w - 2}{w + 1}$	A1	