

Mark Scheme
Practice papers

GCSE Mathematics
Paper 5AM1H_01

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our qualifications website at www.edexcel.com. For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at www.btec.co.uk.

If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

Ask The Expert can be accessed online at the following link:

<http://www.edexcel.com/Aboutus/contact-us/>

Alternatively, you can speak directly to the subject team at Pearson about Edexcel qualifications. Their contact details can be found on this link:

www.edexcel.com/teachingservices

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for raising achievement through innovation in education. Find out more about how we can help you and your students at:

www.pearson.com/uk

All the material in this publication is copyright

© Pearson Education

NOTES ON MARKING PRINCIPLES

- 1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- 2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- 4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- 5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- 6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
 - i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.
 - ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
 - iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme

M1 – method mark
A1 – accuracy mark
B1 – Working mark
C1 – communication mark
QWC – quality of written communication
oe – or equivalent
cao – correct answer only
ft – follow through
sc – special case
dep – dependent (on a previous mark or conclusion)
indep – independent
isw – ignore subsequent working

Question		Working	Answer	Mark	Notes
1	(a)	1 tin lasts 4 days so $4 + 4 + 2$	10	2	M1 1 tin lasts 4 days A1 cao
	(b)	$128 \div 500 = 0.256$ $2 \times 108 = 216$ $216 \div 900 = 0.240$	The supermarket is cheaper.	4	M1 $128 \div 500$ M1 $216 \div 900$ A1 0.256 or 0.240 C1 conclusion ft based on at least M1
2	(a)	250×0.45	£112.50	2	M1 250×0.45 A1 cao
	(b)	$100 \times 0.30 = 30$	£165	2	M1 $100 \times 0.30 + 135$ A1 cao
	(c)	800 miles gets $\pounds 135 + \pounds 150 \neq 2 \times 165$	No, with reason	2	M1 'Expenses per mile are variable' A1 'Between below 300 and above' Or M1 gives an example A1 example is correctly worked out
3	(a)		0.75	2	M1 $75 \div 100$ oe A1 0.75 (accept 0.73 – 0.77)
	(b)	Difference is £60 $\pounds 60 \times 0.75$	£45	3	M1 $160 - 100$ M1 $\pounds 60 \times '0.75'$ Or M1 $0.75 \times 160 = 120$ M1 $0.75 \times 100 = \frac{75}{45}$ A1 ft on '0.75'

Question		Working	Answer	Mark	Notes																
*4		Area of roof = $10 \times 6 = 60\text{m}^2$ 40% of 60 = 24 $24 \div 4 = 6$	Correct explanation	4	M1 10×6 M1 '60' $\times 0.4$ oe M1 '24' $\div 4$ C1 conclusion based on $3 \times 2 = 6$																
5	(a)	Using Line of best fit with temp = 30	Correct plots	2	B1 cao B1 cao																
	(b)		75	2	M1 Using Line of best fit with temp = 30 A1 71 – 79																
	(c)		Correct explanation	1	C1 Line of best fit predicts negative time oe																
6	(a)	<table border="1"> <thead> <tr> <th></th> <th>M</th> <th>F</th> <th>Tot</th> </tr> </thead> <tbody> <tr> <th>A</th> <td>18</td> <td>7</td> <td>25</td> </tr> <tr> <th>C</th> <td>26</td> <td>9</td> <td>35</td> </tr> <tr> <th>Tot</th> <td>44</td> <td>16</td> <td>60</td> </tr> </tbody> </table>		M	F	Tot	A	18	7	25	C	26	9	35	Tot	44	16	60	Summarises data in table	3	M1 at least two of 26, 18, 60 in the correct place M1 all other entries completed A1 fully correct entries
	M	F	Tot																		
A	18	7	25																		
C	26	9	35																		
Tot	44	16	60																		
	(b)		15%	2	M1 $\frac{9}{60} \times 100$ A1 cao																
7		Pays $100 + 20$ $\frac{20}{120} \neq \frac{1}{5}$	Explanation	2	M1 Works out 120% A1 $\frac{20}{120} \neq \frac{1}{5}$																
8		25% of £8000	£2000	3	B1 25% M1 $8000 \times '0.25'$ oe A1 ft on 25%																

Question		Working	Answer	Mark	Notes
9		$\frac{4+7}{2} \times 6 = 33$ $33 \times 8.99 = \text{£}296.67$	£296.67	3	M1 $\frac{4+7}{2} \times 6$ M1 '33' $\times 8.99$ A1 cao
10		Let x m be the length of a rod. $5x + 1 \geq 3x + 2$ $5x - 3x \geq 2 - 1$ $x \geq 0.5$	0.5 m	3	B1 $5x + 1 \geq 3x + 2$ M1 correctly isolate terms in x A1 cao
11	(a)	$10 \times 15 = 150$ $0.6 \times 0.3 = 0.18$ $\frac{0.18}{150}$	$\frac{3}{2500}$	4	M1 10×15 or 6×3 oe M1 use of consistent units M1 $\frac{0.18}{150}$ A1 cao
	(b)	No of seconds = $3 \times 60 \times 60 = 10800$ $10800 \times 4.2 \times 10^9$	4.536×10^{13}	2	M1 Time $\times 4.2 \times 10^9$ A1 cao

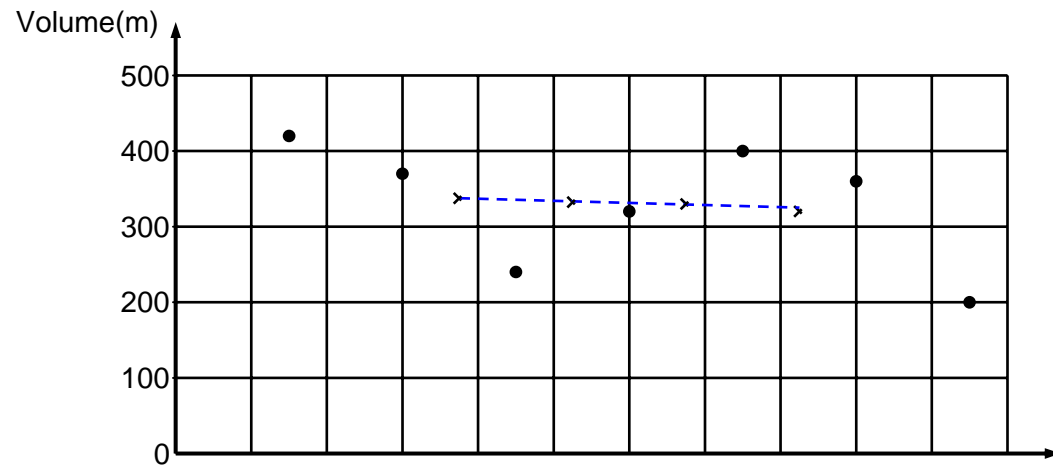
Question		Working	Answer	Mark	Notes
12	(a)	Year 1 investment $2000 \times 1.04^3 = 2249.728$ Year 2 investment $2000 \times 1.04^2 = 2163.20$ Year 3 investment $2000 \times 1.04 = 2080$ Or Year 1 $2000 \times 1.04 = 2080$ Year 2 $4080 \times 1.04 = 4243.20$ Year 3 $6243.20 \times 1.04 = 6492.928$	£6492.93	4	M1 2000×1.04^3 oe M1 2000×1.04^2 oe M1 adds 3 years A1 cao Or M1 2000×1.04 M1 $(2080 + 2000) \times 1.04$ M1 $(4243.20 + 2000) \times 1.04$ A1 cao
	(b)	$10000 \times x^6 = 12500$ $x^6 = 12500 \div 10000$ $x = 1.25^{\frac{1}{6}} = 1.038$	3.8	3	M1 $10000 \times x^6 = 12500$ M1 $x = 1.25^{\frac{1}{6}}$ A1 3.8%
13	(a)	$(420 + 370 + 240 + 320) \div 4 = 1350 \div 4$	337.5	2	M1 $(420 + 370 + 240 + 320) \div 4$ A1 cao
	(b)		Correct plot	2	B1 all at correct height B1 at correct horizontal displacement
	(c)		Line	1	B1 Line drawn
14			C2: $=A2 \times B2$ D2: $=(A2+B2) \times 2$ E2: $=C2 \times 2 + D2 \times 0.5$	4	B1 cao B1 $=(A2+B2) \times 2$ oe M1 Linear expression in C2 and D2 A1 $=C2 \times 2 + D2 \times 0.5$ oe

Question		Working	Answer	Mark	Notes										
15		$3a + 2p = 420$ $2a + 3p = 400$ $9a + 6p = 1260$ $4a + 6p = 800$ $5a = 460; a = 92$ $3 \times 92 + 2p = 420$	$a = 92, p = 72$	4	M1 for eliminating one variable correctly (allow one arithmetical error) A1 Correct value of either a or p M1(dep) substitution of value of a or p into one of the equations A1 Correct value of the other variable.										
16	(a)	$\frac{PR}{40} = \frac{75}{50}$ $PR = 40 \times 1.5$	60	2	M1 $\frac{PR}{40} = \frac{75}{50}$ oe A1 cao										
	(b)	$540 \div 1.5$	£360	2	M1 $540 \div 1.5$ oe A1 cao										
	(c)	64×1.5^2	£144	2	M1 64×1.5^2 A1 cao										
17	(a)	$x + y \leq 105$ $y \leq 0.5x$ $2x + 4y \leq 240$	Feasible region	3	B1 $x + y \leq 105$ oe B1 $y \leq 0.5x$ oe B1 $2x + 4y \leq 240$ oe										
	(b)			2	M1 All 3 lines drawn (ft) A1 ft correct region identified										
	(c)	$C = 180x + 230y$ <table border="1" style="display: inline-table; vertical-align: top;"> <thead> <tr> <th>x</th> <th>y</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>60</td> <td>30</td> <td>17700</td> </tr> <tr> <td>90</td> <td>15</td> <td>19650</td> </tr> <tr> <td>105</td> <td>0</td> <td>18900</td> </tr> </tbody> </table>		x	y	C	60	30	17700	90	15	19650	105	0	18900
x	y	C													
60	30	17700													
90	15	19650													
105	0	18900													

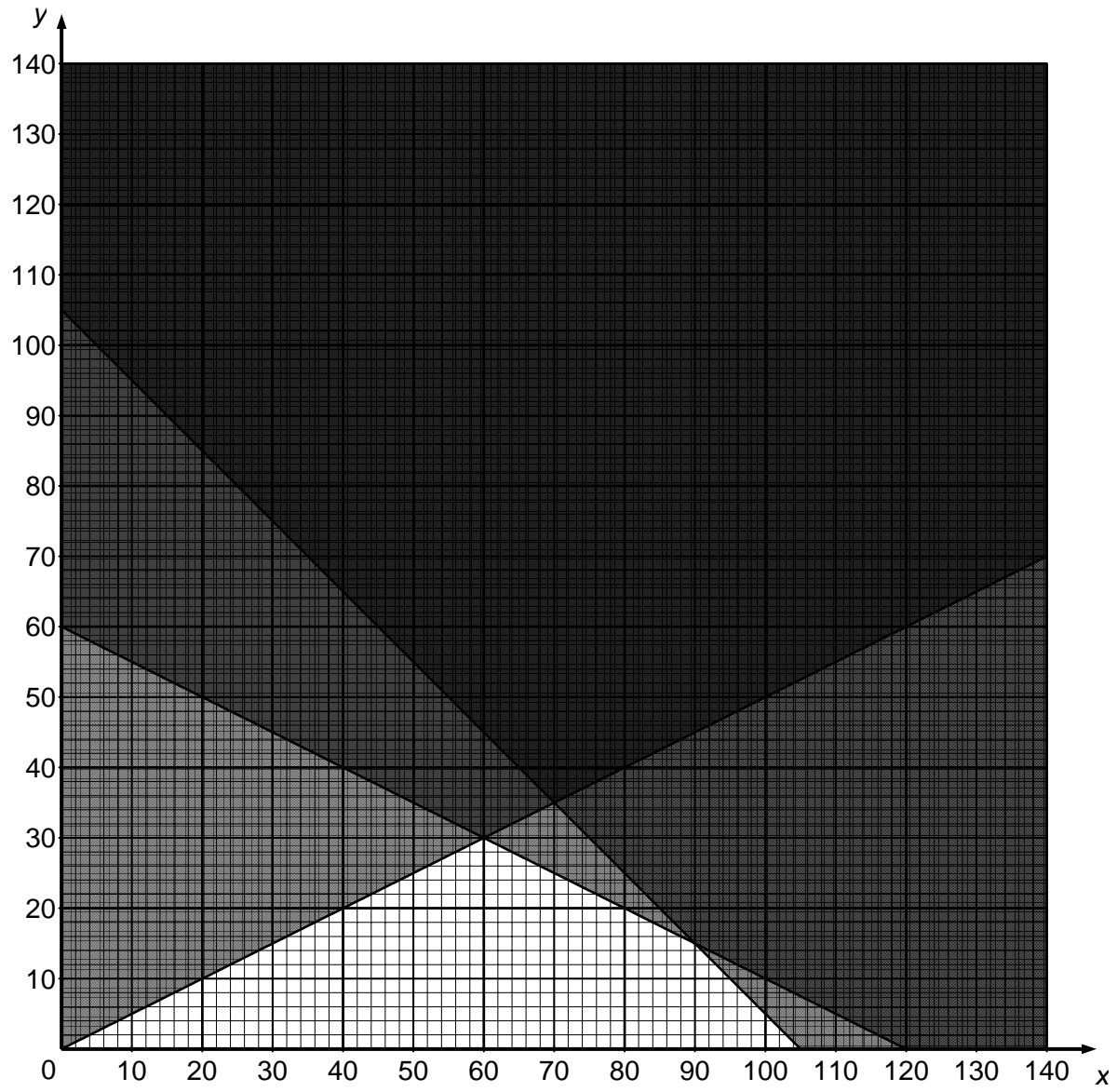
Question		Working	Answer	Mark	Notes
18	(ai)		64 mph	1	B1 cao
	(aii)		74 mph	1	B1 cao
	(b)	Draws cumulative frequency diagram Median = 63 mph IQR = 69 – 58 = 11 mph	Average speeds are about the same. Dispersion in the afternoon is greater	5	M1 Draws Cumulative frequency diagram A1 Correct A1 Correct median ft A1 Correct IQR ft C1 compares medians and IQRs
	(c)	$240 \times \frac{5}{100}$	12	2	M1 $240 \times \frac{5}{100}$ A1 cao
19	(a)	2^4	16 times	2	B1 2^4 B1 16 cao
	(b)	$2 = x^4$	$2^{\frac{1}{4}}$	2	M1 $2 = x^4$ A1 $2^{\frac{1}{4}}$ oe

Question		Working	Answer	Mark	Notes
20		<p>Area of rectangle is $\frac{W}{2} \times L$</p> <p>Width of a parallelogram = $\frac{W}{4}$</p> <p>Area of a parallelogram = $\frac{W}{4} \times L$</p> <p>Area of conductor = $\frac{WL}{2} + 2 \times \frac{WL}{4} = WL$</p> <p>$3WL = W^2$</p>	3	5	<p>B1 Area of rectangle is $\frac{W}{2} \times L$</p> <p>B1 Width of a parallelogram = $\frac{W}{4}$</p> <p>M1 Area of conductor = $\frac{WL}{2} + 2 \times \frac{WL}{4}$</p> <p>A1 $3WL = W^2$</p> <p>A1 cao</p>

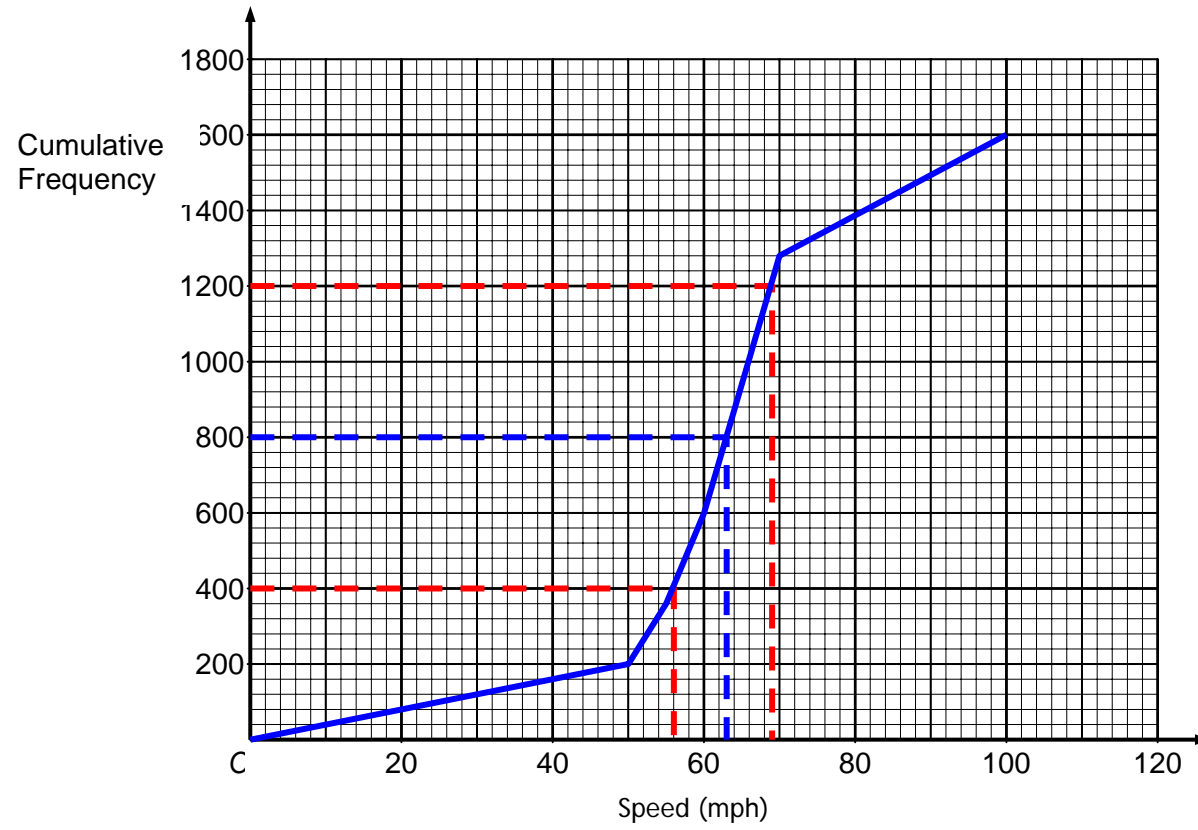
11.



15.



17.



For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE