

Mark Scheme (Results)

June 2011

Applications of Mathematics (GCSE)
Unit 1: 5AM1F_01 (Foundation)

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our website at www.edexcel.com.

If you have any subject specific questions about the content of this Mark Scheme 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/>

June 2011

Publications Code UG027294

All the material in this publication is copyright

© Edexcel Ltd 2011

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

5AM1F_01					
Question		Working	Answer	Mark	Notes
1	(a)	4×4.10	16.40	2	M1 for 4×4.10 or 16.4 A1 cao
	(b)	$10 \div 1.4 = 7.142857143..$	7	2	M1 for $10 \div 1.4$ or 7.1(42857...) or 7 lots of 1.4 A1 cao
	(c)	$4.5(0) \times 7 \div 10$	3.15	2	M1 $4.5(0) \times 7 \div 10$ or a complete percentage method A1 cao
2	(a)		Alyssum	1	B1 cao
	(b)		Pink, red, white	1	B1 cao (in any order)
	(c)		Dahlia	1	B1 cao
	(d)	3 months = $4 \times 3 = 12$ or $30 + 31 + 31 = 92$; $92 \div 7 = 13.14..$	12 or 13	1	B1 for 12 or 13 or 13.1 or 13 weeks, 1 day, etc.
3	(a)		route distance	4	M1 for a route beginning at A and visiting at least 3 other towns or a complete route not beginning at A but visiting every town A1 for a complete route starting at A and finishing at E M1 for an attempt to sum the lengths on their route A1 ft the correct total distance for their route.
	(b)	$6 \times 60 = 360$ $360 \div 5 =$	72	2	M1 for $6 \times 60 \div 5$ A1 cao SC B1 1.2 seen.

5AM1F_01					
Question		Working	Answer	Mark	Notes
4	(a)	Balance = £312 + £145 = £457 Sum of items = £450.32 Final balance = £6.68	6.68	4	M1 adding the items (=450.32) M1 312+120+25 M1 "312+120+25"- "450.32" A1 cao
	(b)	500×1.2 (oe) = 600 $600 \div 12 =$	50	4	M2 for 500×1.2 (=600) (oe) (M1 for 500×0.2 (=100) (oe) M1 for $600 \div 12$ or $100 \div 12$ or $1.2 \div 12$ or $500 \div 12$ A1 cao SC: B2 for an answer of 8.33 or 8.34
5	(a)	$40 \div 4 + 3 = 10 + 3 =$	13	2	M1 for $40 \div 4 + 3$ A1 cao
	(b)	$9 - 3 \times 4 = 6 \times 4 =$	24	3	M1 for subtraction of 3 or times 4 M1 (dep) for subtraction of 3 and times 4 A1 cao NB: the above could be shown as part of an equation.
6			Chart or table	4	B1 for suitable labels or key to differentiate the two garages B1 for each week clearly labelled B1 for accurately representing the data (allow 1 plotting error) C1 for a fully correct diagram or chart including labels
7		$3x=180$ $x=180 \div 3$	60	2	M1 $2x+x=180$ or $180 \div 3$ or equivalent calculation A1 cao

5AM1F_01					
Question	Working	Answer	Mark	Notes	
8	(a)	$306 \div 20$	15.3	2	M1 for $\text{sum} \div 20$ A1 cao
	(b)	ordering the mid value	15	2	M1 for attempt to identify midpoint or 14,16 A1 for 15
	(c)		14	1	B1 cao
	(d)		Explanation	1	B1 explanation: eg (c) or 14 or mode because only one which is a true size, or one which shop is most interested in (greatest sales), or dress sizes even numbers only
9	(a)(i)		12.60	3	B1 cao
	(ii)	$\pounds 12.60 \times 12$	151.20		M1 for "(i)" $\times 12$ A1 ft
	(b)		59	1	B1 cao
	(c)	$\frac{1.08}{7.20} \times 100$	15%	3	M1 for $\frac{1.08}{7.20}$ oe M1 for $\frac{1.08}{7.20} \times 100$ A1 cao Or M1 $\frac{6.12}{7.20}$ M1 $100 - \frac{6.12}{7.20} \times 100$ A1 cao

5AM1F_01				
Question	Working	Answer	Mark	Notes
10		Data collection sheet	3	B3 for a completely correct data collection sheet, including 3 columns with headings: type, tally, frequency (B2 for partially correct data collection sheet) (B1 for one column correctly labelled)
11	(a)		11 (27) (38) (12) 19 31 23 46 (69)	2 B2 for all correct (B1 for 2, 3 or 4 correct)
	(b)		19	1 B1 ft for "19"
	(c)	$\frac{46}{69}$	$\frac{2}{3}$	2 M1 for "46" / 69 A1 ft
12		$36 \times 8.5 \times 5 = 1530$ $1530 \div 8 = 191.25$ or could plan for 191, 191, 191 then 192	191 or 192	4 M2 $36 \times 8.5 \times 5$ (M1 for the product of any two of these terms) M1 (dep on at least M1 achieved) $\div 8$ A1 cao SC B1 $36 \div 8$ oe
13	(a)	$5.5 \times 30 \div 25$	6.6	2 M1 for $5.5 \times 30 \div 25$ or a complete ratio method A1 cao
	(b)	$6.6 = 6600 \text{ ml}$ $2.70 \times 6600 \div 300$	£59.40	3 M1 for a correct and relevant conversion of <i>l</i> to ml or ml to <i>l</i> M1 $2.70 \times \text{"22"}$ ("22" may be seen as $\frac{6.6 \times 1000}{300}$ oe) A1 cao

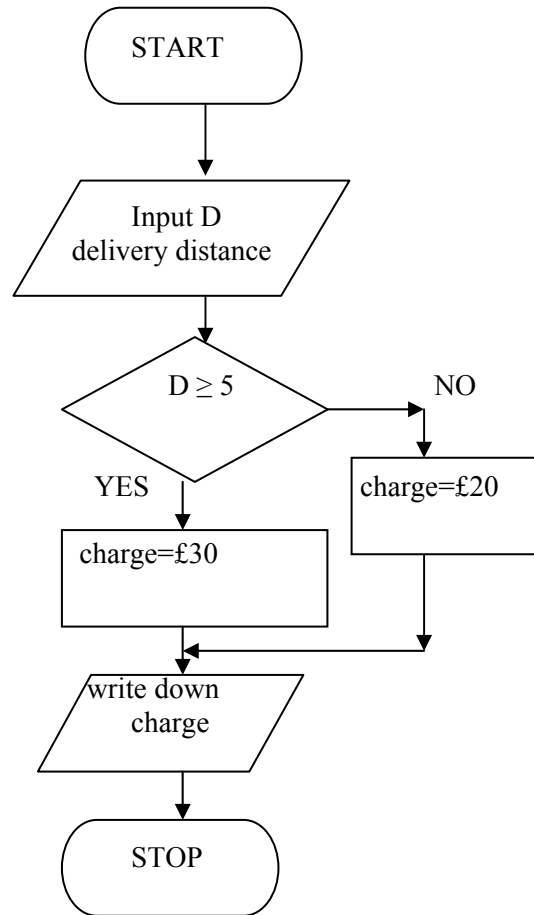
5AM1F_01				
Question	Working	Answer	Mark	Notes
14	$6 \times 3.5 = 21$ feet $21 \times 30\text{cm} = 630$ cm 630 cm = 6.3 m OR $6 \times 30 = 180$ cm = 1.8m $1.8 \times 3.5 = 6.3$ m OR 6ft = 2m; $2 \times 3.5 = 7$ m	$5.1 < "6.3"$ No: will not fit under the bridge	4	M1 for between 3 & 4 men will be same height as lorry M1 for imperial/metric conversion eg 1 foot \approx 30 cm, or 6ft converted to 2 m. A1 for lorry height given as 5.4 – 8 m or 18ft - 24ft C1 (dep on a previous M1)for comparison and conclusion drawn from their answers
15	(i) (ii)	E2 total: $A2+B2+C2+D2$ F2 mean: $E2/4$	3	B1 for $=A2+B2+C2+D2$, $=SUM(A2:D2)$ B1 for $=E2/4$, $=(A2+B2+C2+D2)/4$, $=AVERAGE(A2:D2)$ B1 for using correct spreadsheet notation; condone missing "=" throughout. NB: do not accept " \div " in place of $"/$ ": this would be counted as incorrect notation.
16	$\text{€}9500 \div 1.08 = \text{€}8796.296..$ $\text{\$}13330 \div 1.55 = \text{€}8600$ OR $\text{€}9500 \div 1.08 \times 1.55 = \text{\$}13634$ OR $\text{\$}13330 \div 1.55 \times 1.08 = \text{€}9288$	Dougies/New York is cheaper	4	M1 for $\text{€}9500 \div 1.08$ ($=\text{€}8796.296..$) M1 for $\text{\$}13330 \div 1.55$ ($=\text{€}8600$) A1 for 8796.29(6..) or 8796.30 and 8600 OR M2 for $9500 \div 1.08 \times 1.55$ A1 for 13634 OR M2 for $\text{\$}13330 \div 1.55 \times 1.08$ A1 for 9288 C1 (dep on M1 being scored) for conclusion that Dougies/New York is cheaper, and a clear comparison of correct figures as justification for the conclusion.

5AM1F_01				
Question	Working	Answer	Mark	Notes
17	Decision box with > 5 NO leading to "charge £20" YES leading to "charge £30" Write down & stop. OR Decision box with ≤ 5 NO leading to "charge £30" YES leading to "charge £20" Write down & stop.	Completed flow chart	5	B1 with > 5 (allow in words) B1 for NO leading to "charge £20" accept C for charge B1 for YES leading to "charge £30" accept C for charge [NB: -B1 for missing "charge" or other statement with the amount] B1 end box (stop) B1 for correctly shaped boxes OR B1 with ≤ 5 (allow in words) B1 for NO leading to "charge £30" accept C for charge B1 for YES leading to "charge £20" accept C for charge [NB: -B1 for missing "charge" or other statement with the amount] B1 end box (stop) B1 for correctly shaped boxes NB: do not penalise if the YES or NO are put in a box.
18	$(24 \div 8) \times 6 = 18 \text{ cm}$	18 cm	4	M2 for $(24 \div 8) \times 6$ (M1 for $24 \div 8$, $8 \div 6$, $6 \div 8$, $8 \div 24$ or a ratio eg $? : 6 = 24 : 8$ etc) A1 cao C1 (indep) for units: cm

5AM1F_01					
Question	Working	Answer	Mark	Notes	
19	(a)(i)	Find the gradient eg by drawing a triangle against the graph, find y/x	0.3-0.5	4	M1 method to find gradient eg 16/40, 8/20, triangle drawn. A1 0.3-0.5 SC: B1 for a negative gradient within the range.
	(ii)	pick two points 15 units apart, and read off values associated with these, finding the difference	4 - 8		M1 eg $15 \times 0.4 = 6$; read off values from graph 15 apart ± 1 mm A1 6 ± 2
	(b)(i)	plot points from given table, and read off solution from intersection OR	46 - 54	3	B1 plot at least 4 points ± 1 mm B1 draw line from 0 units to at least 100 units (within overlay) B1ft 46-54 from single intersection point of two straight line segments.
	(ii)	find equations of both lines and equation to calculate intersection point			

5AM1F_01					
Question	Working	Answer	Mark	Notes	
20	(a)	4 sq paving stones per 1m^2 Large squares: 16 stones each $= 5 \times 16 = 80$ Each large triangle: 4 small triangle & 6 sqs 4 lg triangles: 16 triangle stones & 24 square stones Total stones: square 104, triangle 16	104 square stones 16 triangular stones OR 80 square stones 64 triangular stones	4	M1 divides the shape into triangles and squares of any size (by diagram or calculation) M1 divides the shape into triangles and squares of the correct size (by diagram or calculation) A1 gives the number of square stones as 104 or 80 A1 gives the number of triangular stones as 16 or 64 SC: for one answer correct award B2 if at most M1 awarded.
	(b)	Area of squares: $5 \times 4 = 20$ area of triangles: $4 \times 2 = 8$ Total area: 28 $"28" \div 5.6 =$ OR Area of square = $0.5 \times 0.5 = 0.25$ Area of triangle = $0.5 \times 0.5 \times 0.5 = 0.125$ Total area = $"104" \times 0.25 +$ $"16" \times 0.125 = 26 + 2 = 28$ $"28" \div 5.6 =$	5	4	M1 for square $5 \times 2 \times 2 (=20)$ or triangles $4 \times 2 \times 2 \div 2 (=8)$ or finding the area of an appropriate shape as part of a general method. M1 for $"20" + "8" (=28)$ or for any appropriate whole method. M1 for $"28" \div 5.6$ A1 cao OR M1 for $0.5 \times 0.5 (=0.25)$ or $0.5 \times 0.5 \times 0.5 (=0.125)$ M1 for $"104" \times 0.25 + "16" \times 0.125 (= 53.25) (=26+2)$ M1 for $"28" \div 5.6$ A1 ft

Question 16 flowchart:



Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email publication.orders@edexcel.com

Order Code UG027294 June 2011

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

Ofqual




Llywodraeth Cynulliad Cymru
Welsh Assembly Government

