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Mark Scheme (Results)

November 2013

Pearson Edexcel GCSE
Linked Pair Pilot in Mathematics
Application of Mathematics (2AM01)
Foundation Paper 2F

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
1	(a)	1.7 + 9.05	10.75	1	B1 cao
	(b)	9.05 – 3.62	5.43	1	B1 cao
2			17	3	M1 48 – 27 + 12 or 21+ 12 or 60 – 27 (=33) M1 50 – "33" A1 cao **or** M1 50 – 48 (=2) or 27 – 12 (=15) M1 "2" + "15" A1 cao
3		Counting squares	Answer in range	2	M1 attempt to count squares A1 10 to 14 SC if M0, then B1 for $9 \leq$ area < 10 or $14 <$ area ≤ 15
4	(a)		3 thousand	1	B1 3 thousand or 3000
	(b)		8 hundredths	1	B1 8 hundredths or $\frac{8}{100}$ or 0.08 (accept 8 cm)

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
5		mum $3 \times 0.80 \times 4 = 9.60$ dad $2 \times 2.50 \times 4 = 20.00$ auntie $4 \times 1.20 = 4.80$	£34.40	4	M1 3×0.80 or 2×2.50 M1 for a correct method find total savings for week (=£8.60) M1 for a correct method to find total savings for a month A1 cao correct money notation **or** M1 3×0.80 or 2×2.50 M1 for a correct method to work out 1 month's savings for either mum or dad or auntie M1 for a correct method to work out total savings for a month A1 cao correct money notation
6	(a)	$11 \times 14 + 12$	166	2	M1 11×14 A1 cao
	(b)		11	2	$12 \times 14 + 9 -$ "166" A1 (ft)

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
7	(a)		185	1	B1
	(b)		2	1	B1
8		3120 + 300 - 1880	£1540	6	M1 for correct method to find total costs M1 480 × 6.50 (=3120) M1 (600 – 480) × 2.50 (= 300) A1 300 M1 for correct method to find profit A1 cao
9	(a)(i)		unlikely	1	B1
	(a)(ii)		evens	1	B1
	(b)		overlay	1	B1 cross marked $\frac{1}{4} < x < \frac{1}{2}$

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
10	(a)		268	1	B1 cao
	(b)		87	2	M1 102 + 186 – 201 A1 cao
	(c)	220 ÷ 50 = 4.4	4 or 5	2	M1 220 ÷ 50 (=4.4) or additions of 50 until >220 A1 accept 4 or 5
11	(a)		10 – 10.5	1	B1 10 - 10.5
	(b)		6.0 to 6.4	1	B1 6.0 - 6.4
	(c)		23 to 25	3	B1 graph fact e.g. 20cm = 7.8 ± 0.2inches M1 appropriate multiplication e.g. (7.8 ± 0.2) × 3 A1 23 - 25 **or** B1 1 inch = 2.5(4)cm M1 60 ÷ 2.5(4) A1 23 - 25

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
12	(a)	9 30 + 40	10 10	1	B1 oe e.g. 10.10, 10:10, 10.10am, ten past ten
	(b)	7 + 30	37	1	B1 cao
	*(c)		Sinita spends more time in exams	4	M1 for correct method to total time for Sinita 8h 25m or 505 min M1 for correct method to convert 500 minutes and Sinita's total time to equivalent units A1 8 hours 25 mins and 8 hours 20 mins or 500 mins and 505 mins C1 (dep on M1) Sinita spends more time in exams
13	(a)		$\frac{1}{24}$	1	B1 $\frac{1}{24}$ oe
	(b)		$\frac{6}{24}$	1	B1 $\frac{6}{24}$ oe
	(c)		$\frac{3}{24}$	1	B1 $\frac{3}{24}$ oe
14	(a)		£4.20	2	M1 2 × 150 + 120 oe A1 accept 4.2
	(b)		5	3	M1 950 – 50 oe M1 “900” ÷ 180 A1 cao

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
15			overlay overlay overlay	2 1 2	B2 square of side length 3± 0.2cm drawn (B1 one side of 3 ± 0.2cm drawn or two angles of 90^o) B1 circle drawn of radius 4 ± 0.2cm M1 for constructing intersecting arcs of equal radius or second side of 5cm drawn A1 for a correct triangle drawn within guidelines NB: Guidelines allow for 2mm tolerance
16		184 × 6 = 1104 195 × 6 = 1170 171 × 6 = 1026 1104 + 1170 + 1026 = 3300 3600 – 3300 **Or** 184 + 195 + 171 = 550 550 × 6 = 3300 3600 – 3300	300	4	M1 for a correct method to find the number of doughnuts sold on one of the days. M1 for a correct method to find the total number of doughnuts sold. M1 3 × 1200 – "3300" A1 cao **or** M1 for a correct method to find the total number of boxes sold M1 for a correct method to find the total number of doughnuts sold. M1 3 × 1200 – "3300" A1 cao

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
*17			Yes there is enough water in bucket C	4	M1 $\frac{2}{3}+\frac{3}{4}+\frac{5}{6}$ M1 $\frac{8}{12}+\frac{9}{12}+\frac{10}{12}$ oe with at least one correct numerator A1 $\frac{27}{12}$ oe C1 (dep on M1) yes, $\frac{27}{12}$ oe > 2, there is enough water in the bucket **or** M1 $1-\frac{2}{3}+1-\frac{3}{4}$ M1 $\frac{4}{12}+\frac{3}{12}$ oe with at least one correct numerator A1 $\frac{7}{12}$ oe C1 (dep on M1) yes, $\frac{5}{6}=\frac{10}{12}>\frac{7}{12}$, there is enough water in the bucket NB Accept decimals if written correct or truncated to 2 dp

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
18			£12.84	2	M1 484.71 ÷ 37.75 A1 cao
19	(a)		125	1	B1 125 ± 2
	(b)		7.5	2	M1 (5 ± 0.2) × 1.5 A1 7.5 ± 0.3
20	(a)		10 00	1	B1 10 00 oe
	(b)		15 to 16	1	B1 15 to 16
	(c)		1.5	1	B1 1.5 oe
	(d)		(on graph)	2	B1 line joining (11 10, 3) to (11 20, 3) B1 line joining (11 20, 3) to (11 40, 4) SC If B0, B0 award B1 for line joining (11 10, 3) to (11 30, 4)
21	(a)		0.32	2	M1 1 – (0.35 + 0.26 + 0.07) A1 cao
	(b)		0.42	2	M1 0.07 + 0.35 A1 oe **or** M1 1 – (“0.32” + 0.26) A1 oe
	(c)		175	2	M1 500 × 0.35 A1 cao

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
*22			No the shoes won't fit	3	M1 $S = 3 \times 11 - 25$ M1 $E = 33 + "8"$ C1 (dep on M1) 41 and 'the shoes will not fit' **or** M1 $38 = S + 33$ M1 $S = 3 \times 11 - 25$ C1 (dep on M1) 8 and 5 and 'the shoes will not fit'
*23			35	3	M1 for a correct first step to find an angle which will lead to x e.g 180 – 125 or 360 – 125 – 90 A1 $x = 35$ C1 (dep M1) one relevant reason **e.g alternate** angles are **equal**
24			760	3	M1 $4560 \div "2 + 7 + 3"$ (=380) M1 "380" × 2 A1 cao
25			153	4	M1 $\pi \times 9.8$ (= 30.(7916...)) or $\pi \times 4.9$ (=15.(3958...)) M1 15.25×4 (=61) or 30.5×2 (=61) M1 (dep on first M1) for a correct method to find the total length of all lines A1 152 -153

Paper: 5AM2F_01					
Question		Working	Answer	Mark	Notes
26		$(14.3^2 - 6.2^2) \div 19.6$ $= 166.05 \div 19.6$	8.5	2	M1 $\frac{14.3^2 - 6.2^2}{19.6}$ A1 8.45 - 8.5
27			100	4	M1 correct method to work out one part of the cross-sectional area M1 correct method to work out total cross-sectional area M1(dep on M1,M1) cross - sectional area × 5 A1 cao **or** M1 correct method to work out one part of the volume M1 correct method to work out a second part of the volume M1 (dep on M1, M1) correct method to work out total volume A1 cao


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