Mark Scheme (Results)

Summer 2017

Pearson Edexcel GCSE
Linked Pair Pilot in Mathematics
Applications of Mathematics (2AM01)
Foundation: (Calculator) Unit 1

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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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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: 5AM1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		−20	1	B1 cao
(b)		Marked at 18	1	B1 cao
(c)		Marked at 65	1	B1 cao
2 (a)		5 circles in Thurs 3.5 circles in Fri	2	B2 both correct oe (B1 1 correct, or both correct but transposed)
(b)		25	2	M1 $2\frac{1}{2}\times10$ oe A1 cao OR M1 $4 \times 10 + 5 - (2 \times 10)$ A1 cao
3 (a)	16 by 1 8 by 2 4 by 4	correct arrangement shown	2	B2 for 16 stones shown in a rectangle (ok if pond in the middle) or a rectangle with correctly labelled sides (B1 for rectangle drawn or 16 stones used)
(b)(i)		14	3	B1cao
(ii)		18 m²		B1 for 18 B1 for m²

Question		Working	Answer	Mark	Notes
4	(a)		(3,7)	1	B1 cao
	(b)		× at (5,2)	1	B1 cao
	(c)	$\dfrac{1+8}{2}, \dfrac{2+6}{2}$ Or Marks M on diagram	(4.5, 4)	2	M1 for either A1 Or M1 allow 2mm tol A1
5			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
6	(a)		268	2	M1 for adding all amounts and dividing by 10 A1 cao
	(b)	200 240 250 260 270 280 280 280 300 320	275	2	M1 for ordering and selecting 270 and 280 A1 cao
	(c)		280	1	B1 cao
	(d)		120	2	M1 for 320 – 200 or 200 to 320 A1 cao

PAPER: 5AM1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
7		155.30	5	M1 34 + 58 + (0) + 56 + 86 (= 234) M1 '234' × 45 (= 10530) M1 for '10530' ÷ 100 = ((£)105.30) M1 for 4 × 12.5(0) (= (£)50) A1 155.3(0) OR M1 34 × 45 (= 1530)(p) or 58 × 45 (= 2610(p)) or 56 × 45 (= 2520(p)) or 86 × 45 (= 3870(p)) M1 for '1530' ÷ 100 or '2610' ÷ 100 or '2520' ÷ 100 or 3870÷ 100 M1 '15.30' + 12.50 (=27.80) or '26.10' + 12.50 (=38.60) or '25.20' + 12.50 (=37.70) or '37.80' +12.50 (=51.20) M1 for '27.80' + '38.60' + '37.70' + '51.20' A1 155.3(0)

Question		Working	Answer	Mark	Notes
8	(a)		April	1	B1 cao
	(b)		4	1	B1 cao
	(c)		2.49 3.54 3.99 23.95	4	B1 cao B1 cao B1 cao B1 ft for total
	(d)		Cheaper to grow	2	M1 for 16 × 2.80 A1 ft for £44.8(0) and correct conclusion Or M1 "23.95"÷ 16 A1 ft £1.49 or £1.50 and correct conclusion
9	(a)		6.0	1	B1 for answer in range 5.8 to 6.2
	(b)			2	B2 for circle, centre *P* and radius 2.5 cm (B1 for circle, centre *P* or radius 2.5 cm)

Question		Working	Answer	Mark	Notes
10	(a)	$100 - (12 + 14 + 9 + 5 + 15 + 8)$	37	2	M1 for adding the percentages or 63 seen A1 cao
	*(b)		Marek spends a greater percentage on food than the average adult	3	M1 for $\dfrac{65}{525} \times 100$ A1 for 12.3….. C1 (dep on M1) for conclusion ft from comparison of '12.3..' % and 12 % OR M1 for $\dfrac{12}{100} \times 525$ oe A1 for 63 C1 (dep on M1) for correct ft from comparison of "63" and 65

PAPER: 5AM1F_01				
Question	Working	Answer	Mark	Notes
11 (a)		18	2	M1 for $7 \times 2 + 4$ A1 cao
(b)		11	3	M1 for subtraction of 4 **or** divide by 2 (could be shown as inverse operations **or** as a reverse flow diagram) M1 (dep) for subtraction of 4 and divide by 2 (could be shown as inverse operations **or** as a reverse flow diagram) A1 cao **OR** M1 for $2x + 4 = 26$ M1 for attempt to rearrange with -4 and $\div 2$ shown A1 cao
12 (a)		6	1	B1 cao
(b)		4	1	B1 cao
(c)		30	3	M1 for $4x + x + x = 180$ M1 for correct method to solve '$4x + x + x = 180$' A1 for 30

PAPER: 5AM1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
13 (a)		$\dfrac{1}{40}$	2	M1 for $\dfrac{3}{2 \times 60}$ A1 cao
(b)		23.10	3	M1 for 34.65 ÷ 3 (= 11.55) M1(dep) for 34.65 −'11.55' or 2×'11.55' A1 cao accept 23.1, 23.10p **or** M1 for $1 - \dfrac{1}{3}$ $(= \dfrac{2}{3})$ or 1 − 0.33 = 0.67 or $0.\dot{6}$ M1 for 34.65 × 2 ÷ 3 or 34.65 × 0.67 or 34.65 × $0.\dot{6}$ A1 cao accept 23.1, 23.10p

Question	Working	Answer	Mark	Notes
*14		Alice plays longer	3	M1 for $\dfrac{80}{100} \times 90$ or $\dfrac{5}{6} \times 90$ M1 for $\dfrac{80}{100} \times 90$ and $\dfrac{5}{6} \times 90$ C1 for Alice (plays) longer oe with 72 and 75 **OR** M1 for 80÷100 (=0.8) or 5÷6 (=0.83…) M1 for 80÷100 (=0.8) and 4÷5 (=0.83…) C1 for Alice (plays) longer oe with 0.8 and 0.83… **OR** M2 for (5 ÷ 6) × 100 C1 for Alice (plays) longer oe with 83….%
15		132	4	M2 42 × 7.5 × 5 (= 1575) (M1 for the product of any two of these terms) M1 (dep on at least M1 achieved) '1575' ÷ 12 A1 cao OR M1 42 ÷ 12 (=3.5) M2 '3.5' × 7.5 × 5 (M1 for a product of any two of the terms) A1 cao

| Question	Working	Answer	Mark	Notes
*16		No As height of bus is more than 5m	4	B1 for a correct conversion eg 1 foot = 30 cm eg 6 feet = 1.8m − 2 m eg 1m = 3 feet − 3.4 feet M1 for method to find scale factor man to lorry eg 4.8 ÷ 1.6 eg sf = 2.8 − 3 A1 bus = 16 feet –19 feet **or** bus = 5.3 m – 6 m C1 (dep on M1) for conclusion supported by calculations eg No as 5.4 m is greater than height of bridge eg No as 16 feet < 18 feet
17 (a)		£0.40	2	M1 for 20 ÷ 50 oe or clear attempt to find gradient A1 for £0.4(0) or 40p
*(b)	From graph 80 units costs £26.50	Yes as cost will be lower	3	M1 for Tariff B price for 80 units 30 × 80 (=2400) **or** 0.3 × 80(=24) B1 for reading from Tariff A graph at 80 units C1 for £24 and £26.5(0) with 'yes' oe OR M1 for drawing a straight line (for Tariff B) through the origin A1 for the correct line up to at least no of units = 80 C1 for £24 and £26.5(0) with 'yes' oe

Question		Working	Answer	Mark	Notes
18	(a)		Point plotted	1	B1 for point plotted at (130, 35)
	(b)		Description	1	B1 for description of dynamic relationship or statement of positive correlation
	(c)		147 - 151	2	B2 for 147 – 151 **OR** M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a horizontal line from 42.5 A1 for answer in the range 147 - 151 or ft their line of best fit
19	(a)		(Ramp) 50 42	2	B2 for (£)50 in B6 and (£)42 in C6 (B1 for one correct entry)
	(b)		= C2–B2 =B2+B3+B4+B5+B6	3	B1 for (=)C2–B2 oe B1 for (=)B2+B3+B4+B5+B6 or (=)SUM(B2:B6) oe or intention to add correct cells is clear B1 for using correct spread sheet notation, in both cases condone missing =
20	(a)	120× 0.08 = 9.60 120 – 9.60 + 8.50	118.90	2	M1 120 × 0.08 (=9.6(0)) A1
	(b)		34	1	B1 cao
	(c)		New total charge box with 8.50 replaced by 11	2	B1 ' total charge =' box with correct shape B1 8.50 replaced by 11

| PAPER: 5AM1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
21		20000	3	M1 for $150\,000 \div 5\,(= 30000)$ M1 for '30000' $\div\,3 \times 2$ oe A1 cao OR M1 $\dfrac{1}{5} \times \dfrac{2}{3} = \left(\dfrac{2}{15}\right)$ M1 for $150\,000 \div 15 \times 2$ oe A1 cao
22	$x + 2x + 2x + 6 = 101$ $5x + 6 = 101$ $5x = 95$	19	4	M1 for $2x$ or $2x + 6$ seen (any letter) M1 (dep) for forming equation $x +$ '$2x$' $+$ '$2x +$ 6' $= 101$ M1 for intention to isolate x term(s) in their equation if of the form $ax + b=101$ A1 cao dep on at least M1 awarded OR M1 for a correct trial with $x \geq 1$ to evaluate x, $2x$ and $2x + 6$ (algebraic expressions may not be seen) M1 for 3 values that sum to 101 M1 for intention to add $19 + 2 \times 19 + 2 \times 19 + 6$ $(=101)$ A1 for 19 cao dep on at least M1 awarded

Q5
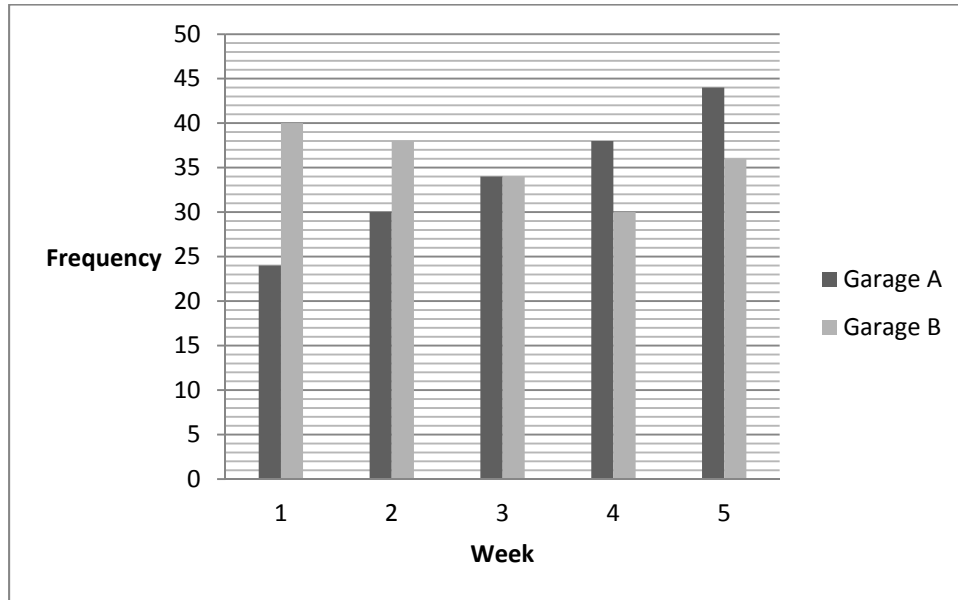
Q17

Cost
in £
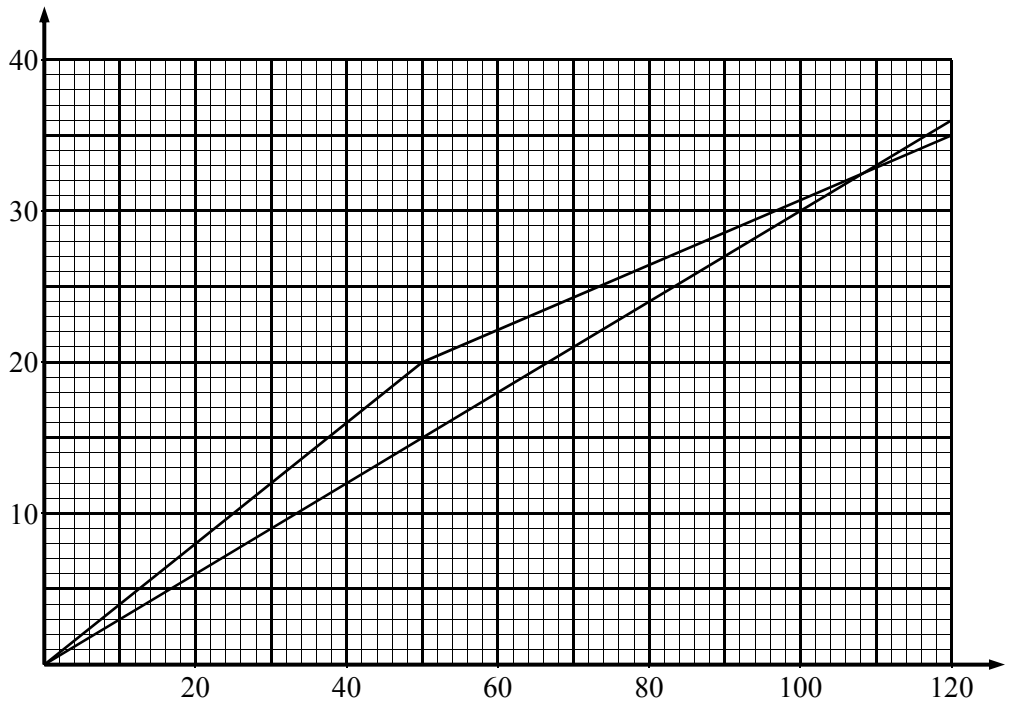
Number of units of electricity used