Mark Scheme (Results)

June 2011

Applications of Mathematics (GCSE)
Unit 2: Applications 5AM2F_01

PEARSON

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/

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

5AM2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)	24+18 + 20	62	2	M1 24+18 + 20 A1 cao
	(b)	AC = 42, BD = 38 or 24-20	4	2	M1 24+18 or 18+20 or 24-20 A1 cao
	(c)		25	2	M1 Evidence that telephones are every mile including at A AND B (e.g. tally marks or similar) A1 cao
2	(a)(i)	17 × 100	1700	2	B1 cao 1700
	(ii)		17000		B1 ft '(i)'x10
	(b)	17 × 100 ÷ 4	425	1	M1 ft '(i)'÷ 4 A1 ft correct number of whole coins given either truncated or rounded
3	(a)		eighty	1	B1 accept 'tens' 'eighty' '10', '10s'
	(b)		'tenths'	1	B1 'tenths' $\frac{7}{10}$, 7 mm
	(c)		25	1	B1 cao
	(d)		0.45	1	B1 0.45, 0.45(0), .45 oe

5AM2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)	(243+425) = 668 668 × 48 Or 243× 48 = 11664 425 × 48= 20400	32064	2	M1 (243+425) × 48 or 243× 48 + 425 × 48 A1 cao
	(b)	380 ÷ 96	4	2	M1 380 ÷ 96 or 3x96 AND 4x96 seen A1 cao
5			36 cm^2	2	B2 34 – 38 (B1 32-34 including 32 but not 34 OR 38-40 including 40 but not 38)
6	(i)		Evens	3	B1 cao
	(ii)		Unlikely		B1 cao
	(iii)		Impossible		B1 cao
7	(a)	120 ÷10 = 12 12×30 = 360	£360	2	M1 for 120 ÷10x30 oe A1 cao
	(b)	6 packs of 10 costs £180 8 single tiles cost £29.52	£209.52	3	M1 for attempting to work out the cost of 6 or 7 packs or 68 tiles in any combination A1 ft correct cost for their purchase A1 cao

Question		Working	Answer	Mark	Notes
8	(a)	$2 \times 220 + 310$	£750	2	M1 $2 \times 220 + 310$ A1 cao
	(b)	$500 \div 60$ 8.33	No as the cost per student is more than £8	4	M1 '500' $\div$ 60 A1 ft '8.33' correct to 2 dp (ie price per pupil) M1 attempting to work out two coach costs C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one previous mark is earned Or M1 60x8 or 60x7.99 A1 480 or 479.40 M1 attempting to work out two coach costs C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one previous mark is awarded
9	(a)	$x + 2x + x + 4$		2	M1 $2x$ seen A1 $x + 2x + x + 4$
	(b)	$T = 4 \times 5 + 4$	28	2	M1 $T = 4 \times 6 + 4$ or 6+12+10 A1 cao
10		12 Sandis 20 Bish 10 Ebos $12 \times 129 + 20 \times 149 + 10 \times 169$ $1548 + 2980 + 1690 = 6218$	Yes	5	B1 for all 3 totals M1 any one of '12' $\times$ 129 or '20' $\times$ 149 or '10' $\times$ 169 M1 '12' $\times$ 129 + '20' $\times$ 149 + '10' $\times$ 169 A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded

5AM2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		Correct diagram	3	B1 BC correct length within tolerance B1 angle ABC correct angle within tolerance B1 AC correct within tolerance
	(b)	Diagram 7 + 6 + 6.6 Cost = 19.6 × 12.99	£250	4	B1 ft AC stated M1 6x12.99 or 7x12.99 or '6.6'x12.99 M1 77.94+90.93+'85.73' A1 ft on 'AC' exact answer or answer given to nearest £10 Or B1 ft AC stated M1 7 + 6 + '6.6' M1 '19.6'×12.99 A1 ft on 'AC' exact answer or answer given to nearest £10

Question		Working	Answer	Mark	Notes
12		£100 = $160 £500 = $800 $800 - $600	$200	3	M1 Equates £ and $ M1 Correct method to attempt to find £500 A1 cao
13	(a)	33 + 0.03 × 400	£45	3	M1 0.03 × 400 or 3 × 400 M1 '12' + 33 A1 cao
	(b)	69 = 33 +0.03 × minutes Minutes = $\dfrac{69-33}{0.03}$	1200	3	M1 69 - 33 M1 Minutes = $\dfrac{"36"}{0.03}$ '36' must not be 69 A1 cao SC B1 for 12 seen
	(c)(i)	400 to 600 is £4 600 to 700 is £2	£64	4	M1 for 200 minutes cost £4 A1 £64 cao
	(ii)	58 − 2 × 4.00 Or 62 − 2 × 6.00	£50		M1 58 – '2' × 4.00 or 58-400x'0.02' or 62-600x'0.02' A1 ft
14	(a)		$\dfrac{1}{100}$	1	B1 $\dfrac{1}{100}$ oe
	(b)		$\dfrac{5}{100}$	1	B1 $\dfrac{5}{100}$ oe
	(c)		$\dfrac{2}{99}$	1	M1 for a numerator of 2 or denominator of 99 A1 cao

5AM2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)	$28 \times 0.50 + 32 \times 0.72 + 50 \times 1.04 +$ 18×1.51 $14.00 + 23.04 + 52 + 27.18$	£ 116.22	3	M1 at least one fx where the fs are correct M1 $\sum fx$ where the fs are correct A1 cao
	(b)	$32 \times (50 - 40) + 40 \times (72 - 59) + 68 \times$ $(104 - 85) + 34 \times (151 - 123)$ $320 + 520 + 1292 + 952 = 3084$ Or $32 \times 50 + 40 \times 72 + 68 \times 104 + 34 \times$ $151 -$ $(32 \times 40 + 40 \times 59 + 68 \times 85 + 34 \times$ $123)$	£30.84	4	M1 attempts to find differences in costs M1 $\sum f \times \mathrm{diff}$ A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded OR M1 $\sum fx$ for first class and second class M1 attempts to find difference between two totals A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded
16			Correct region	4	B4 fully correct OR B1 straight line parallel to BC and 2 cm (± 0.2 cm) from it B1 shading to the right of the line B1 circle radius 2 cm (± 0.2 cm) centre the centre of the rectangle B1 shading inside the circle Ignore any drawing outside the given rectangle

Question		Working	Answer	Mark	Notes
17		Area CDEF = 10× 4 = 40 Area ABFG = 10 × 10 = 100 Area semi circle = $\pi \times 5^2 \div 2 = 39\ldots$ Total area = 179 179 ÷ 20 = 8.9….	9	8	B1 10 M1 '10' × 4 A1 cao M1 area *ABFG* = '10' × '10' M1 $\pi \times \left(\dfrac{'10'}{2}\right)^2 \div 2$ or $\pi \times \left(\dfrac{'10'}{2}\right)^2$ M1 '40' + '39' + '100' dep on one previous M1 M1 '179' ÷ 20 A1 cao
18	(a)		Diagram	2	M1 trapezium with at least one side correct A1 cao
	(b)	Length of roof = 6.2 m Area of roof = 6.2 × 4 = 24.8 Other areas are 10, 16, 19.5 and 24	113.8 m²	5	M1 a correct method to find the area of a rectangular face **or** 10 or 24 or 16 or '24.8' seen M1 a correct method to find the area of a trapezoidal face A1 for 19.5 or for 15 and 4.5 M1 for adding areas of 5 or 6 faces A1 113 – 115 (accept 89 – 91)
19	(a)		Liz explanation	1	B1 Liz because she carried out most trials
	(b)	12 + 34 + 57 = 103 40 + 100 +300 103 ÷ 40	0.23 or $\dfrac{103}{440}$	2	M1 (12 + 34 + 57)/*b* where *b* > 103 or *a*/(12 + 28 + 34 + 66 + 57 + 243) where *a* < 440 A1 0.23or 0.234(09..) or $\dfrac{103}{440}$ oe (SC If M0 then B1 for $12 \div 40$ or $34 \div 100$ or $57 \div 300$

5AM2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		0.8 on 1st branch 0.3 and 0.05 on 2nd branches	2	B1 0.8 oe on 1st branch B1 0.3 and 0.05 oe on 2nd branches
	(b)	0.2×0.3	0.06	2	M1 0.2 ×'0.3' A1 0.06 ft from '0.3' in the tree diagram

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning