Mark Scheme (Results)

January 2014

Pearson Edexcel International GCSE Mathematics A (4MA0/2F) Paper 2F

Pearson Edexcel Certificate Mathematics A (KMA0/2F)

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- 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.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

- **Types of mark**
  - M marks: method marks
  - A marks: accuracy marks
  - B marks: unconditional accuracy marks (independent of M marks)

- **Abbreviations**
  - cao – correct answer only
  - ft – follow through
  - isw – ignore subsequent working
  - SC - special case
  - oe – or equivalent (and appropriate)
  - dep – dependent
  - indep – independent
  - eeoo – each error or omission
  - awrt – answers which round to

- **No working**
  If no working is shown then correct answers normally score full marks
  If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **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 it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

  Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

  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 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.

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

- **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: eg. Incorrect cancelling 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 eg algebra.
  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

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

Question	Working	Answer	Mark	Notes
Apart from questions 12(c) and 13 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.				
1. (i)		11	1	B1
(ii)		12	1	B1
(iii)		4	1	B1
(iv)		10	1	B1
				Total 4 marks

2. (i)		40	1	B1
(ii)		(0).4	1	B1ft (if 0 < % < 100) ie allow ft if their % from (i) is between 0 and 100 Accept leading or trailing zeros.
				Total 2 marks

3. (a)		1.3	1	B1
(b)		5.2	1	B1
(c)		arrow at 4^{th} mark from 0	1	B1
(d)		400	1	B1
				Total 4 marks

4. (a)		Thursday	1	B1
(b) (i)		20	1	B1 Positive integers only.
(b) (ii)		80	1	B1 ft from (b) (i) i.e 4 x "20" Positive integers only.
(b) (iii)		90	1	B1 ft from (b) (i) i.e 4.5 x "20" Positive integers only.
(c)		35	1	B1
(d)	65/100	13/20	2	M1 oe A1
				Total 7 marks

5. (i)		kilometres	1	Accept km.
(ii)		m^2	1	Accept sq metres, square metres, $metres^2$
(iii)		ml	1	Accept millilitres, cm^3, $centimetres^3$, cubic cm(s), cubic centimetres.
				Total 3 marks

6. (i)		R marked at 0.5	1	B1
(ii)	B marked between 1cm & 3cm from 0		1	B1
(iii)		G marked at 0	1	B1
				Total 3 marks

7. (a)		Meribel	1	B1 accept misspellings if meaning is clear
(b)	(– 5) – (–8)	3	2	M1 M1 for selecting –8 A1 accept –3
(c) (i)	(–2) + (–14) oe	–16	2	M1 A1 cao
(c) (ii)		10	1	B1 Accept 14
				Total 6 marks

8. (a)	3 + (4 x 2) oe	11	2	M1 A1	Accept 3 + 4 x 2 14 with no working = M1A0
(b)	(35 – 3) ÷ 2	16	2	M1 A1	Accept 35 – 3 ÷ 2 33.5 with no working = M1A0
(c)	"x" + 8 = 2"x" + 3	5	2	M1 A1	"x" + 8 & 2"x" + 3 seen or correct table of costs for Budget and Economy taxis to include the costs for 5 km.
					Total 6 marks

km	B	E
1	5	9
2	7	10
3	9	11
4	11	12
5	13	13

9. (a)		9 to 9.1	1	B1
(b)		11.8	1	B1
(c)		1.4	1	B1
				Total 3 marks

10. (a) (i)		80	1	B1
(a) (ii)	angles at a point = 360 degrees		1	B1 (indep) Accept "angles at a centre = 360 degrees". "angles in a complete / full turn = 360 degrees". "angles in one revolution = 360 degrees". "angles in a pie chart = 360 degrees" any numerical explanation involving 360
(b)	140 / 50 x 90 oe			M2 i.e. one complete full correct method. If not M2 then M1 for 140 ÷ 50 (= 2.8) or 50 ÷140 (= 0.357..) or 90 ÷ 50 (= 1.8) or 50 ÷ 90 (= 0.55....)

		252	3	A1 cao
				Total 5 marks
11. (i)		60	1	B1 Look on diagram if no answer on answer line.
11. (ii)	(*BCD* =) "60" + 52 (= 112°) (*CBD* or *BDC* =) (180 – "112") ÷ 2 (= 34°) (DBC =) "60" – "34"	26	3	M1ft Their ft from angle *x*. Can be marked on diagram. M1ft (Dep) Dependent on previous M1 Their *x* – "CBD" A1 cao
				Total 4 marks

12. (a)		3/5 5/8 65% 0.66 2/3	3	B3 Accept 0.6, 0.625, 0.65,0.66,0.66 rec If not B3 then award B2 for..... • 3 numbers in a correct consecutive sequence • or 3/5 & 5/8 & 2/3 correctly converted to decimals or %'s (at least 3 dp rounded or truncated) • or all 5 numbers in correct descending order. If not B2 then B1 for • 2 fractions correctly converted to decimals or %'s (at least 3 dp rounded or truncated).
(b)		1/4	1	B1
(c)	$\frac{11a}{12a} - \frac{9a}{12a} = \frac{2a}{12a}$		2	M1 for $\frac{11a}{12a}$, $\frac{9a}{12a}$ A1 for $\frac{2a}{12a}$ (dep on M1) a = a positive integer
				Total 6 marks

13.	$18y + 30 = 39$ or $3y + 5 = 6.5$ $18y = 39 - 30$ or $3y = 6.5 - 5$	0.5 oe	3	M1 M1 for correct expansion $\{18y + 30\}$ M1 A1 Dependent on at least M1
				Total 3 marks

14. (a)		6	1	B1
(b)		8	1	B1
(c)	0.5 x (11 + 7) x 10	90	2	M1 M1 for (0.5 x 2 x 10) + (7 x 10) + (0.5 x 2 x 10) A1
(d)	"90" x 12	1080	2	M1 ft Their area in (c) x 12 A1 ft
				Total 6 marks

15. (a)	30 ÷ 2 (=15) or 15.5	2	2	M1 or clear attempt to find 15th and 16th values. A1
(b)	(0x2) + 1x10 + 2x7 + 3x6 + 4x3 + 5x2 "64" ÷ 30	2.13 rec	3	M1 M1 for 5 correct products stated or evaluated. M1 Dependent on first M1. Sum of the products / 30 A1 Accept 2.1 or better with no working. Accept 2 if both M marks awarded.
				Total 5 marks

16. (a)		$x = 6$ oe	1	B1 Accept $x - 6 = 0$
(b)		Shape **P** in correct position	2	B2 Vertices at (8,2) (8,4) (9,4) (9,3) (11,4) & (11,2) If not B2 then: • B1 for correct reflection in line $x = k$ where $k \neq 6$ • or at least 2 vertices in correct position.
(c)		rotation 90° clockwise or −90° (centre) (0,0) or *O* or origin	3	B1 B1 accept 270° or 270° anticlockwise. B1 condone lack of brackets around 0,0 **Award no marks if multiple transformations.**
				Total 6 marks

17. (a)		k^5	1	B1
(b)		$14t - 6$	1	B1 Mark response on answer line or final statement in body of script, do not isw.
(c) (i)		$8y + 24 - 6y + 21$ $2y + 45$	2	M1 M1 for 3 terms with correct signs or 4 terms without signs. A1 Mark response on answer line or final statement in body of script, do not isw.
(c) (ii)		$x^2 - 6x - 4x + 24$ $x^2 - 10x + 24$	2	M1 M1 for 3 terms with correct signs or 4 terms without signs. A1 Mark response on answer line or final statement in body of script, do not isw.
(d)		v^6	2	M1 or v^7 / v or $v^4 \times v^2$ or v^{11} / v^5 A1
				Total 8 marks

18. (a)	840 : 40 oe or 840 ÷ 40 oe or 1 : 21	21	2	M1 A1 Accept 21 : 1
(b)	105 ÷ 3 x 2	70	2	M1 M1 for 105 ÷ 3 (=35) A1
(c)	(105 ÷ {4+3}) x 3	45	2	M1 M1 for 105 ÷ (4+3) (=15) A1
				Total 6 marks

19.	3.2 x 3.2 (= 10.24) $\pi \times 5^2$ (= 78.5....) { π = 3.14 or better} $\pi \times 5^2 - 3.2 \times 3.2$	68.3	4	M1 Area of square. M1 Area of circle, accept awrt 78.5 →78.6 incl. M1 Intention to subtract areas from correct methods. A1 Accept awrt 68.3 or 68.4
				Total 4 marks

20.	Fully correct factor tree or repeated division to reach prime factors (condone 1's) or 3, 5, 5, 11 or 3 x 5 x 5 x 11 x 1	3 x 5 x 5 x 11	3	M2 factors must multiply to 825 If not M2 then award M1 for correct but incomplete factor tree/ division ladder which includes 2 different primes. (e.g. 25 x 3 x 11) A1 cao Accept $3 \times 5^2 \times 11$ and dots in place of x signs
				Total 3 marks

21. (a) (i)		6, 12	1	B1
(a) (ii)		2, 3, 5, 6, 7, 9, 11, 12	1	B1 Withhold mark if any numbers repeated.
(b)		No Universal set has only numbers less than 13	1	B1 Dependent on "No" box being ticked. (idea that 14 does not belong to $\mathcal{E}$).
				Total 3 marks

22.	4 x 2.6 (= 10.4) (4 x 2.6 – 5) ÷ 3	1.8	3	M1 or 5.4 seen. M1 Correct full calculation which would lead to correct answer. A1cao
	Alternative solution: Any 4 numbers (including 5) that have a total 10.4 or any 3 numbers that have a total of 5.4 (Sum of their 3 numbers) ÷ 3	1.8	3	M1 M1 Correct full calculation which would lead to correct answer. A1
				Total 3 marks

				TOTAL FOR PAPER: 100 MARKS

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