Mark Scheme (Results)

Summer 2017

Pearson Edexcel International GCSE
In Mathematics (4MA0) Paper 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

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  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

International GCSE Maths

Apart from questions 15b, 20, 23 (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method

Q		Working	Answer	Mark	Notes
1	(a)		−8, −4, −1, 3, 7	1	B1 cao
	(b)		0.007, 0.078, 0.4, 0.407, 0.8	1	B1 cao
	(c)		0.6	1	B1 cao
	(d)		90	1	B1 cao
	(e)		0.35	1	B1 cao
					Total 5 marks

2	(a)		cone	1	B1 Accept circular based pyramid
	(b) (i)		prism	1	B1 accept triangular based prism
	(b) (ii)		6	1	B1 cao
	(b) (iii)		9	1	B1 cao
	(c)		12 cm^3		B2 If not B2 for 12 then allow B1 for 6 or 8 or 10
				3	B1 for cm^3 (indep)
					Total 7 marks

3	(a)		Blues	1	B1	cao
	(b)		Jets	1	B1	cao
	(c) (i)	8 ÷ 2 × 3 **or** 1 circle is 4 goals or 3 × 4			M1	can be implied by one correct answer
			12	2	A1	cao
	(c) (ii)		10	1	A1	cao
						Total 5 marks

4	(a)		pentagon	1	B1	
	(b)		parallel sides marked	1	B1	
	(c)		congruent triangle	1	B1	
						Total 3 marks

5	(a)	3 × 1.59 + 2 × 0.85 + 5 × 0.45 (=8.72) **or** 4.77 + 1.7(0) + 2.25			M1	Condone 1 error only in numbers of items or if subtotals only seen, allow 1 error
		20 – "8.72"			M1	
			11.28	3	A1	[SC B1 for 17.11]
	(b)	50 ÷ 2.40 or 20.83…			M1	
			20	2	A1	
						Total 5 marks

6	(a)		450	1	B1
	(b)		8.9	1	B1
					Total 2 marks

7	(a)		$\frac{12}{18}$	1	B1 cao
	(b)	840 ÷ 7 × 3 or $\frac{3}{7}\times 840$ oe			M1 Allow 840 × 0.42(85...)
			360	2	A1 cao
	(c)	$\frac{96}{240}$ oe e.g. $\frac{48}{120}, \frac{24}{60}, \frac{8}{20}$, etc			M1
			$\frac{2}{5}$	2	A1 cao
	(d)	8 ÷ 2 × 9 or $\frac{9}{2}\times 8$ oe			M1
			36	2	A1 cao
					Total 7 marks

8	(a)(i)		unlikely	1	B1	cao
	(a)(ii)		evens	1	B1	cao
	(b) (i)		$\frac{1}{12}$	1	B1	or 0.083(3…)
	(b) (ii)		$\frac{9}{12}$	1	B1oe	$\frac{3}{4}$ or 0.75 or 75%
	(b) (iii)		0	1	B1oe	**NB**. Penalise incorrect notation once only in (b) by deducting one mark
						Total 5 marks

9	(a)	12 × 0.6 + 1.45			M1	Fully correct method
			8.65	2	A1	
	(b)	13.45 – 1.45 (=12)			M1	Or sight of ÷0.6 and −1.45 in any order
		"12" ÷ 0.6			M1dep	Or sight of −1.45 and ÷0.6 in correct order
			20	3	A1	
						Total 5 marks

10	360 – 56 – 38 (= 266) or $x + x + 56 + 38 = 360$ oe			M1	
	"266" ÷ 2			M1	dep
		133	3	A1	
					Total 3 marks

11	(a)		(−2, 4)	1	B1	
	(b)		point plotted	1	B1	Unambiguous
	(c)		$x = 3$ drawn	1	B1	Minimum 2 cm long
						Total 3 marks

12	(a)	11 × 18 (=198) **or** 10 × 11 (=110) **or** 18 × 5 (=90) **or** 5 × 8 (=40) **or** 10 × 6 (=60) **or** 6 × 8 (=48)			M1	method to find area of any rectangle
		11 × 18 – 8 × 6 **or** 10 × 11 + 8 × 5 **or** 18 × 5 + 10 × 6			M1	complete method
			150	3	A1	cao
	(b)	9 × 5 (=45) **or** 9×5×h = 360 **or** 360÷9(=40) **or** 360÷5(=72)			M1	As part of working
		360 ÷ (9×5) **or** "40"÷5 **or** "72"÷9			M1	(dep)
			8	3	A1	cao
						Total 6 marks

13	(a)	$\frac{105}{360} \times 240$ oe			M1
			70	2	A1 cao
	(b)	$\frac{120}{300} \times 360$ oe			M1
			144	2	A1 cao
					Total 4 marks

14	(a) (i)		t, a, l	1	B1	
	(a)(ii)		p, o, r, t, u, g, a, l, i, y	1	B1	No repeats
	(b)		No with reason	1	B1	eg. ‘a is in both sets’ or ‘they share a member’ oe (but not member**s**/letter**s**)
						Total 3 marks

15	(a)	$2 \times (-3)^2 - 7\times(-3)$ oe e.g. $2(9) - (-21)$ **or** $2\times9 + 21$ **or** $18 + 21$			M1	Brackets must be round $(-3)^2$
			39	2	A1	
	(b)	$4x + 12 = 9x - 10$ **or** $x + 3 = \frac{9x}{4} - \frac{10}{4}$ oe			M1	for $4x + 12$ (may not be in an equation) or for dividing RHS by 4
		$12 + 10 = 9x - 4x$ or $-9x + 4x = -12 - 10$ or $22 = 5x$ or $-5x = -22$ or $3 + 2.5 = 2.25x - x$ or $1.25x = 5.5$			M1	(ft from $4x + b = 9x + 10$) for all terms in x isolated on one side and numbers on other side
			4.4	3	A1	for 4.4 oe eg. $\frac{22}{5}$, $4\frac{2}{5}$ dep on at least M1
	(c)		$-1, 0, 1, 2, 3$	2	B2	B1 for $-2, -1, 0, 1, 2$ or list with one error or omission: e.g. $-2, -1, 0, 1, 2, 3$ **;** $-1, 0, 1, 2$; $-1, 1, 2, 3$, etc
						Total 7 marks

16	(a)	250 × 97			M1	Completely correct method or figures 2425(0), e.g. 242.5
			24 250	2	A1	
	(b)	4 × 500 (=2000) **or** 500 ÷ 93.5 (=5.34759…)			M1	
		"4 × 500" ÷ 93.5 **or** "5.34.." × 4			M1	
			21	3	A1	21 – 21.4
						Total 5 marks

17	$\frac{-4+1}{2}$ **or** $\frac{9+5}{2}$			M1	or for $(-1.5\ ,\ y)$ or $(x,\ 7)$ or $(7, -1.5)$
		$(-1.5\ ,\ 7)$	2	A1	oe
					Total 2 marks

18	(a)	20 × 0.3			M1	Or for an answer of $\frac{6}{20}$
			6	2	A1	condone '6 out of 20'
	(b)	$0.3 + x + 3x = 1$			M1	oe, e.g. $4x = 0.7$ M1 for (20 – "6") ÷ 4 (=3.5)
		(1 – 0.3) ÷ 4 **or** 0.175 **or** (1 – 0.3) × 0.75			M1	complete method to find x or $3x$ M1 for $\frac{3\times"3.5"}{20}$
			0.525	3	A1	oe, e.g. $\frac{21}{40}$, 52.5% A1 or 0.525 oe
						Total 5 marks

19		$T = 6m + 9g$	3	B3 Or $T = 3(2m + 3g)$ [award B2 if $T = 6m + 9g$ is incorrectly simplified](condone $T = 6\times m + 9\times g$)
				if not B3 then
				B2 for $T = 6m + kg$ **or** $T = km + 9g$ (k may be zero) **or** $6m + 9g$
				if not B2 then
				B1 for $6m$ **or** $9g$ **or** $T = am + bg$ (where $a \neq 0$ or 6 and $b \neq 0$ or 9)

				Total 3 marks

20 (a)	eg. $\frac{14}{24}+\frac{9}{24}$ **or** $\frac{56}{96}+\frac{36}{96}$ oe			M1	correct fractions with common denominators and intention to add
	$\frac{14}{24}+\frac{9}{24}=\frac{23}{24}$ **or** $\frac{56}{96}+\frac{36}{96}=\frac{92}{96}=\frac{23}{24}$ oe	shown	2	A1	dep on M1
(b)	$\frac{5}{3}\times\frac{31}{15}$ oe			M1	fractions written as correct improper fractions and intention to multiply
	$\frac{1}{3}\times\frac{31}{3}$ **or** $\frac{155}{45}$ oe			M1	correct cancelling or multiplication of numerators and denominators without cancelling
	$\frac{1}{3}\times\frac{31}{3}=\frac{31}{9}$ **or** $\frac{155}{45}=\frac{31}{9}$ **or** $3\frac{20}{45}$ oe	shown	3	A1	$\frac{31}{9}$ or $3\frac{20}{45}$ dep on M2
					Total 5 marks

21	$180 - 156$ (=24) **or** $180(n - 2) = 156n$ oe **or** $90(2n - 4) = 156n$ oe			M1
	$360 \div$ "24" **or** $(180 \times 2) \div (180 - 156)$ **or** $\frac{90 \times 4}{2 \times 90 - 156}$			M1 complete method
		15	3	A1
				Total 3 marks

22	$420 \div (4 + 5 + 3)$ (=35) [or Manu = 140 or Liam = 175]			M1	M2 for $\frac{3}{12} \times 420$ oe
	"35" × 3 (=105)			M1 or Ned = 105	
	$\frac{"105" + 75}{420} \times 100$ oe			M1	
		43	4	A1 42.85 – 43	
					Total 4 marks

23	e.g.$4x = 16$ **or** $-20y = 40$ or $20y = -40$ or $3(14 + 5y) + 5y = 2$			M1	First stage of method to eliminate one variable – allow one error only in multiplication
	eg. $3 \times 4 + 5y = 2$ or $3x + 5 \times -2 = 2$			M1	(dep on M1) method to find second variable
		$4, -2$	3	A1	for both 4 and -2 dep on at least M1
					Total 3 marks