

Mark Scheme (Results)

January 2016

Pearson Edexcel International GCSE  
Mathematics A (4MA0)  
Paper 1FR

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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
  - eeo – each error or omission
  - awrt – answer which rounds 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.

**International GCSE Maths January 2016 – Paper 1FR Mark scheme**

**Apart from Questions 5 and 17(a) (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
<b>1</b> (a) (i)		cuboid	1	B1
(ii)		cylinder	1	B1
(iii)		pyramid	1	B1
(b)	$6 \times 4$		2	M1
		24		A1
				<b>Total 5 marks</b>

<b>2</b> (a)		$\frac{5}{9}$	1	B1
(b)		three squares shaded	1	B1
(c)		0.9	1	B1
(d)	$\frac{3}{25} \times 100$ or 0.12		2	M1
		12		A1
				<b>Total 5 marks</b>

<b>3</b> (a)		7, 9 or 3, 21	1	B1 Accept either pair.
(b)		55	1	B1
(c)		36	1	B1
(d)		53	1	B1
				<b>Total 4 marks</b>

<b>4</b>	(a)			3	M1	At least three vertical bars, joined or separated, with at least one correct.
					M1	Four vertical bars, joined or separated, with at least two correct.
			Correct bar chart		A1	Four correctly labelled bars of the correct height.
	(b)	$(20 + 15 + 5 + 35)/4$		2	M1	
			18.75		A1	Allow 19; allow 18 if M1 awarded. SCB1 for 48.75
	(c)	$35 - 5$		2	M1	Allow $8 - 35$ or 8 to 35
			30		A1	
	(d)	$35 : 15$		2	M1	
			$7 : 3$		A1	SCB1 for 3:7
						<b>Total 9 marks</b>

<b>5</b>	(a)		4.5	1	B1	cao
	(b)		8480	1	B1	cao
	(c)	$\frac{10 \times 20}{40}$		2	M1	Accept for two of 10, 20 and 40.
			5		A1	dep on M1
						<b>Total 4 marks</b>

<b>6</b>	(a)		36	1	B1	cao
	(b)		192	1	B1	cao
	(c)	20×6 or list of first 20 terms		2	M1	Accept 114 or 126
			120		A1	
	(d)		$T = 6n$	2	M1	for $6n$ or $n6$ or $6 \times n$ or $T =$ a linear expression in $n$ .
					A1	Accept $T = 6 \times n$ or $T = n6$
<b>Total 6 marks</b>						

<b>7</b>	(a)		Nitrogen	1	B1	
	(b)	or 183 – 34		2	M1	
			149		A1	Accept –149
	(c)	357 + 39 or –39 – 357		2	M1	
			396		A1	Accept –396
<b>Total 5 marks</b>						

<b>8</b>	(a) (i)		(3, 2)	1	B1	
	(ii)		(–1, 2)	1	B1	
	(b)		parallelogram	1	B1	
	(c)		2	1	B1	
	(d)	2×4		2	M1	Accept any correct expression.
			8		A1	
	(e)	$(\frac{1}{2}(-2+3), \frac{1}{2}(0+2))$		2	M1	Also award for either $x$ or $y$ coordinate correct.
			$(\frac{1}{2}, 1)$		A1	
	<b>Total 8 marks</b>					

<b>9</b>	(a)		6561	1	B1
	(b)		19	1	B1
	(c)	$\frac{14.14}{3.5}$		2	M1 For $\frac{a}{b}$ where $a = 14.14$ or/and $b = 3.5$
			4.04		A1 Accept $\frac{101}{25}$
					<b>Total 4 marks</b>

<b>10</b>	(a)	$360 - 250$ or $180 - 125$ or $2q + 250 = 360$ oe		2	M1
			55		A1
	(b)		36	1	B1
	(c)		112	1	B1
	(d)	base angles of an isosceles triangle are equal		1	B1 Accept $CF = FD$
	(e)	$180 - 68 - 68$		2	M1
			44		A1
					<b>Total 7 marks</b>

<b>11</b>	(a)	$\frac{360}{72} \times 8$ or $5 \times 8$ or $\frac{360}{9}$ or $9^\circ = 1$ candidate		2	M1
			40		A1
	(b)	$\frac{8}{72} \times 126$ or $\frac{126}{9}$ or $\frac{126}{360} \times "40"$		2	M1
			14		A1 cao
					<b>Total 4 marks</b>



<b>12</b>	(a)		24	1	B1
	(b)	$3y = 12 \times 4$ or $\frac{1}{4}y = \frac{12}{3}$ or $y = 12 \times \frac{4}{3}$ or $y = 12 \div \frac{3}{4}$		2	M1
			16		A1
	(c)		$9(2c - 3)$	2	B2 Award B1 for $3(6c - 9)$
	(d)	$t^2 - 4t + 5t - 20$		2	M1 for three correct terms out of four or for four terms correct except for signs.
			$t^2 + t - 20$		A1
					<b>Total 7 marks</b>

<b>13</b>	(a)		Reflection in $y = 1$	2	B1 for reflection B1 for $y = 1$ Award no marks if not a single transformation.
	(b)	Parallelogram with vertices (3, -3), (9, -3), (6, -6) and (0, -6)		2	B2 Award B1 for any translation of the correct parallelogram.
	(c)	Parallelogram with vertices (-3, 1), (-3, 3), (-2, 4), (-2, 2)		2	B2 Award B1 for a correct rotation through $\pm 90^\circ$ about any centre.
					<b>Total 6 marks</b>

<b>14</b>	(a)	$\frac{163 \text{ (million)}}{683 \text{ (million)}} \times 100$		2	M1
			23.9		A1 Accept 23.8 – 23.9
	(b)	$\frac{17.6}{100} \times 1028 \text{ (million)}$ or 180.(928) (million)		3	M1 M2 for 1028 (million) $\times 1.176$ oe
		$\frac{17.6}{100} \times 1028 \text{ (million)} + 1028 \text{ (million)}$			M1
			1209		A1 Accept 1208 – 1209
<b>Total 5 marks</b>					

<b>15</b>	(a)	$1 - 0.5 - 0.15 - 0.05$		2	M1
			0.3		A1
	(b) (i)	$40 \times 0.15$		2	M1 Accept $40 \times 0.15 \times 5$ or $6 \times 5$ or 30
			6		A1
	(ii)	$40 \times 0.5$ or 20 <b>and</b> $40 \times 0.05$ or 2		3	M1
		"20" $\times$ 1 + "6" $\times$ 5 + "2" $\times$ 10			M1 Dep ft from (i)
			70		A1
		<b>Alternative Method</b> $1 \times 0.50 + 5 \times 0.15 + 10 \times 0.05$ or 1.75 "1.75" $\times$ 40			M1 M1 Dep A1
			70		
<b>Total 7 marks</b>					

<b>16</b>	(a)	$\pi \times 6.5^2$		2	M1
			133		A1 awrt 133
	(b)	$10.5^2 - 6.5^2$ or $110.25 - 42.25$ or 68		3	M1
		$\sqrt{10.5^2 - 6.5^2}$ or $\sqrt{110.25 - 42.25}$ or $\sqrt{68}$ oe			M1
			8.25		A1 awrt 8.25
					<b>Total 5 marks</b>

<b>17</b>	(a)	Correct factor tree or repeated division to find factors 2, 2, 2, 3, 5, 5 (condone inclusion of 1's)		3	M2 for finding correct factors (condone the inclusion of 1) M1 for finding a set of factors (with a product of 600) which includes at least 3 of the six prime factors. This may be a factor tree that is incomplete or only correct to this stage, for instance.
			$2^3 \times 3 \times 5^2$		A1 dep on M2
	(b)	$\frac{5^{12}}{5^3}$ or $\frac{5^{10}}{5}$ or $\frac{5^{11}}{5^2}$		2	M1 For a correct application of an index law.
			$5^9$		A1
					<b>Total 5 marks</b>

<b>18</b>	(a)		$e < 2$	1	B1 Must be the final answer.
	(b)	$5 - 4 < 3e$ or $-3e < 4 - 5$		2	M1 Condone use of $\leq$ or $=$
			$e > \frac{1}{3}$		A1 Must be the final answer. Accept $e > 0.333(333\dots)$
	(c)		1	1	B1
					<b>Total 4 marks</b>

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