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# Mark Scheme (Results)

Summer 2017

Pearson Edexcel International GCSE  
In Mathematics A (4MA0) Paper 2FR



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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

- **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 21 and 24 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.

Q	Working	Answer	Mark	Notes
<b>1</b> (a)		24016	1	B1
(b)		88000	1	B1
(c)		$\frac{3}{10}$	1	B1 (three) tenth(s) 0.3
(d)		42 or 49	1	B1 Either 42 or 49 (or both with no other number)
(e)	Eg $\frac{5}{8} \times 48$ or $\frac{1}{8} \times 240$ or $48 \div 8 \times 5$	30	2	M1 For a complete method A1
(f)	Eg $\frac{60}{100} \times 750$ or $\frac{750}{10} \times 6$ or $6 \times 75$	450	2	M1 For a complete method A1
				<b>Total 8 marks</b>

<b>2</b>	(a)		Football	1	B1
	(b)		20	1	B1
	(c)		Correct bar	1	B1 Bar for boys at 40 for basketball
	(d)		5 : 7	2	M1 25 : 35 A1 Allow 1 : 1.4 or 0.71(428... ): 1 or $\frac{5}{7}:1$  SCB1 for 7 : 5 or 1.4:1 or $1:\frac{5}{7}$ or or 1:0.71(428.....)
					<b>Total 5 marks</b>

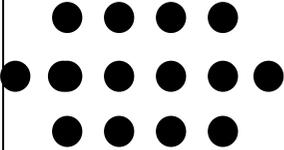
<b>3</b>	(a)		-20,-15,-10,-5	1	B1 Numbers all correctly marked
	(b)		-7,-4,-2, 3 ,5 ,8	1	B1 All correctly ordered
	(c)	$72 + 58$ or $72 - -58$ or $-58 - 72$	130	2	M1 For a complete method A1 Allow -130
					<b>Total 4 marks</b>

<b>4</b>	(a)		1	1	B1 1, 1.0, 100%
	(b)		0.3	1	B1 oe
					<b>Total 2 marks</b>

<b>5</b>	(a) (i)		218	1	B1
	(ii)		238	1	B1
	(iii)		2673	1	B1
	(iv)		24	1	B1
	(b)		$7 \times (3 + 8) - 2$	1	B1
	(c)		39	1	B1
	(d)		10280	2	M1 Any one of 10000, 64 or 216 A1 10280
					<b>Total 8 marks</b>

<b>6</b>	(a)		8	1	B1
	(b)		6	1	B1
					<b>Total 2 marks</b>

7	(a) (i)		centimetres	1	B1 cm allow any unambiguous spelling
	(ii)		kilograms	1	B1 kg allow any unambiguous spelling
	(iii)		Square metres	1	B1 m <sup>2</sup> allow any unambiguous spelling
	(b)	$3 \times 150$ or $3 \times 0.15$  $2000 - 3 \times 150$ or $1550$ or $2 - 3 \times 0.15$ or $1.55$	    1550 ml Or 1.55 l	3	M1 or for $2 \times 1000$ or $2000$ or $150 \div 1000$ or $0.15$ or $450 \div 1000$ or $0.45$ M1 A1 SCB1 for 1850 ml or 1.85 l
					<b>Total 6 marks</b>

8	(a)			1	B1
	(b)	$3 \times 11 + 2$ or $3 \times 10 + 5$ oe		2	M1 for $3n+2$ or 5,8,11,14 ...continued for 11 items with at most 1 error or for a correct diagram drawn A1
					<b>Total 3 marks</b>

<b>9</b>		35	2	M1 $7 \times 5$ oe or $7 \times 6$ or 42 A1 35
				<b>Total 2 marks</b>

<b>10</b>	(a)		$123^\circ - 127^\circ$	1	B1
	(b)	Bearing of $070^\circ$ from <i>B</i> and 7 cm from <i>B</i>	Correct angle and length	2	B1 Correct bearing within overlay B1 A point 7cm from <i>B</i> . Accept 6.8cm -7.2cm
					<b>Total 3 marks</b>

<b>11</b>	(a)		1830	1	B1
	(b)			2	M1 45 mins or 3 hours or evidence of adding on to 10 30 and subtracting 15 mins to get to 1015 oe A1 3 hours 45 minutes
	(c)		3 hrs 45 mins 9 25 pm	1	B1 9 25 (pm) or 2125
					<b>Total 4 marks</b>

12		CB, CD, CF TB, TD, TF	2	M1 For at least 3 correct combinations or for all correct with repeats A1 All correct and no repeats
				<b>Total 2 marks</b>

13	(-2,-5) (-1,-3) (0,-1) (1, 1) (2, 3) (3, 5)	Correct line between $x = -2$ and $x = 3$	3	B3 For a correct line between $x = -2$ and $x = 3$
				B2 For a correct line through at least 3 of (-2,-5) (-1,-3) (0,-1) (1, 1) (2, 3) (3, 5) <b>or</b> For all of (-2,-5) (-1,-3) (0,-1) (1, 1) (2, 3) (3, 5) plotted but not joined.
				B1 For at least 2 correct points stated (may be in a table) <b>or</b> For a line drawn with a positive gradient through (0,-1) or For a line with the correct gradient. <b>NB</b> a line joining (0,-1) to (2, 0) scores B0
				<b>Total 3 marks</b>

<b>14</b> (a)			<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	2	B2 All entries correct or B1 5 correct entries
		<b>1</b>	0	1	2	3	4	5		
		<b>2</b>	1	0	1	2	3	4		
		<b>3</b>	2	1	0	1	2	3		
(b) (i)		$\frac{1}{18}$						1	B1ft From complete table Accept 0.055(555...) rounded or truncated to at least 3 dp	
(ii)		$\frac{6}{18}$						1	B1ft oe From complete table Eg $\frac{1}{3}$ Accept 0.33(333...) rounded to at least 2 dp	
									<b>Total 4 marks</b>	

<b>15</b> (a)		$9gh$	1	B1
(b)		$8a - 5m$	2	B2 B1 for $8a$ or $-5m$
(c)		$12 - 28c$	1	B1
(d)		$y(y + 8)$	1	B1
				<b>Total 5 marks</b>

<b>16</b>	$10 \times 4.2 \times 7.5$ or $315 \text{ (cm}^3\text{)}$ oe	18	4	M1	For volume of cuboid
	Eg $0.5 \times 7 \times x \times 5$ or $17.5x$ oe			M1	indep For volume of triangular prism
	$10 \times 4.2 \times 7.5 = 0.5 \times 7 \times x \times 5$ or $17.5x = 315$ oe or $\frac{10 \times 4.2 \times 7.5}{0.5 \times 7 \times 5}$ or $\frac{315}{17.5}$ oe			M1	Dep on M2 For a correct equation involving volume of cuboid and volume of prism or For a correct expression for $x$
				A1	18 SCB2 for For volume of cuboid = 315 and final answer = 9
					<b>Total 4 marks</b>

<b>17</b>	(a)	Eg $\frac{30}{12} \times 110$ or $2.5 \times 110$ or $\frac{30}{12}$ or 2.5 or $\frac{110}{12} \times 30$ or $9.16(666...) \times 30$ or $\frac{110}{12}$ or $9.16(666...) \text{ oe}$	275	2	M1 Accept 9.16(666...) rounded or truncated to at least 3 SF  A1
	(b)	Eg $\frac{375}{100} \times 12$ or $3.75 \times 12$ or $375 \div \frac{100}{12}$ or $375 \div 8.33(333...)$ or $\frac{12}{100} \times 375$ or $0.12 \times 375$	45	2	M1 For a complete method Accept 8.33(333...) rounded to at least 3 SF  A1
					<b>Total 4 marks</b>

<b>18</b>	(a) (i)		5, 15	1	B1
	(ii)		5, 7, 9, 10, 11, 13, 15	1	B1
	(b)		4, 6, 8, 10, 12, 14	2	B2 B2 for all correct and none incorrect. If not B2 then B1 for 4 or more correct and no more than 1 incorrect.
					<b>Total 4 marks</b>

<b>19</b>		14.37028405	2	M1 A1	102.66 or 1.843(9...) or 7.143(9..) Accept 14.37(028.....) rounded or truncated to at least 4SF
				<b>Total 2 marks</b>	

<b>20</b>	(a)	$x^2 - 3x + 7x - 21$		2	M1 A1	For 3 correct terms or for 4 correct terms ignoring signs or for $x^2 + 4x + c$ for any non-zero value of $c$ or for $\dots + 4x - 21$ cao
	(b)	$5p - 3p = 9$ or $2p = 9$ or $-9 = 3p - 5p$ or $-9 = -2p$	$x^2 + 4x - 21$	2	M1 A1	oe eg $\frac{9}{2}$ or $4\frac{1}{2}$
	(c)		$y^{11}$	1	B1	
	(d)		$h^8$	1	B1	
					<b>Total 6 marks</b>	

21	Eg $9x = 22.5$ or $18y = 27$ or $-18y = -27$ or $5x - (13 - 4x) = 9.5$ or $4x + 5x - 9.5 = 13$ or $5\left(\frac{13-2y}{4}\right) - 2y = 9.5$ or $4\left(\frac{9.5+2y}{5}\right) + 2y = 13$	$x = 2.5, y = 1.5$	3	M1 For a complete method to eliminate one variable (condone one arithmetic error)
	Eg $5 \times "2.5" - 2y = 9.5$ or $5x - 2 \times "1.5" = 9.5$			M1 Dep on M1 For substituting the other variable or starting again to eliminate the other variable
				A1 dep on M1 NB: candidates showing no correct working score 0 marks.
				<b>Total 3 marks</b>

22	(a)		$30 < d \leq 40$	1	B1	Accept 30 – 40
	(b)	$5 \times 5 + 15 \times 12 + 25 \times 17 + 35 \times 20 + 45 \times 6$ <b>or</b> $25 + 180 + 425 + 700 + 270$ <b>or</b> 1600		4	M2	$f \times d$ for at least 4 products with correct mid- interval values <b>and</b> intention to add.  If not M2 then award M1 for $d$ used consistently for at least 4 products within interval (including end points) <b>and</b> intention to add <b>or</b> for at least 4 correct products with correct mid-interval values with no intention to add
		$\frac{25 + 180 + 425 + 700 + 270}{5 + 12 + 17 + 20 + 6} \text{ or } \left( = \frac{1600}{60} \right)$			M1	dep on M1 (ft their products) NB: accept their 60 if addition of frequencies is shown
			26.7		A1	Accept 26.6 – 26.7 inclusive Accept 27 if M3 awarded Do not accept fractions or mixed numbers, eg $\frac{80}{3}$ or $26\frac{2}{3}$
						<b>Total 5 marks</b>

23 (a)	$4x \geq 27 - 13$ or $4x \geq 14$ or $-4x \leq 13 - 27$ or $-4x \leq -14$	$x \geq 3.5$	2	M1 Accept an equation in place of an inequality or Accept wrong inequality sign or Accept 3.5 oe given as answer  A1 oe Must be the final answer
(b)		Correct line drawn	1	B1 For a closed circle at $-1$ with line that goes at least as far as 3 or For a closed circle at $-1$ with an arrow on a line pointing to the right
(c)		$-2, -1, 0, 1, 2$	2	B2 B1 for list with one error or omission: e.g. $-2, -1, 0, 1, 2, 3;$ $-1, 0, 1, 2;$ $-2, -1, 1, 2;$ $-3, -2, -1, 0, 1, 2$ SCB1 for $-3, -2, -1, 0, 1$
				<b>Total 5 marks</b>

24	$\frac{16}{5}$ and $\frac{8}{3}$	A fully correct method shown	3	M1	For at least one correct improper fraction
	$\frac{16}{5} \times \frac{3}{8}$ or $\frac{48}{15} \div \frac{40}{15}$			M1	Dep For first fraction unchanged, changing $\div$ to $\times$ and inverting the 2 <sup>nd</sup> fraction or Converting each fraction with a common denominator of 15 (or multiple of 15) with $\div$ sign
				A1	$\frac{48}{40}$ from correct working
				<b>Total 3 marks</b>	

25	$(x^2 =) 18^2 - 13^2$ or $324 - 169$ or $155$	12.4	3	M1	Squaring and subtracting
	$(x =) \sqrt{18^2 - 13^2}$ or $\sqrt{155}$			M1dep	For square rooting
				A1	Accept 12.4 – 12.46 inclusive
	<b>Alternative Methods - Using Trigonometry</b>  Eg $\sin^{-1}\left(\frac{13}{18}\right)$ and $18\cos^{-1}46.2(382\dots)$ oe or $\cos^{-1}\left(\frac{13}{18}\right)$ and $18\sin^{-1}43.7(617\dots)$ oe			M2	For a complete method
				A1	Accept 12.4 – 12.46 inclusive
				<b>Total 3 marks</b>	

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