

# Mark Scheme (Results)

June 2016

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

Pearson Edexcel Level 1/Level 2 Certificate  
Mathematics A (KMA0)  
Paper 1F

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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.

<b>International GCSE Maths</b>				
Apart from question 15 (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.				
<b>Q</b>	<b>Working</b>	<b>Answer</b>	<b>Mark</b>	<b>Notes</b>
<b>1</b> a		Three thousand seven hundred (and) eight	1	B1
b		4000	1	B1
c		774	1	B1
d	$\frac{4}{24}$			M1 any fraction equivalent to $\frac{1}{6}$
		$\frac{1}{6}$	2	A1
e	$48 \div 8$ or $\frac{1}{8} \times 48$ oe or $6$ or $\frac{7}{8} \times 48$			M1
		42	2	A1
				<b>Total 7 marks</b>

<b>2</b> a		24	1	B1
b	$21 + 10$			M1 or for 21
		31	2	A1 SC : B1 for 32
c		$2\frac{1}{2}$ envelopes drawn	1	B1 accept 2 envelopes and two $\frac{1}{4}$ envelopes
				<b>Total 4 marks</b>

<b>3</b>	a		6.3 cm	2	B2 B1 for 6.1 – 6.5 ; B1 for cm <b>OR</b> B1 for 61 – 65 ; B1 for mm <b>OR</b> B1 for 2.4 – 2.6 ; B1 for inches
	b		pair of parallel lines marked	1	B1
	c		trapezium	1	B1
	d		obtuse angle marked	1	B1
					<b>Total 5 marks</b>

<b>4</b>			1, 2, 4, 5, 8, 10, 20, 40	2	B2 for all correct and no incorrect (ignore repeats) Award B1 for at least 3 correct factors and no more than 1 incorrect
					<b>Total 2 marks</b>

<b>5</b>	a		800	1	B1
	b		9.6	1	B1
	c	$5 \times 1000 (=5000)$ <b>or</b> $6 \times 750 (= 4500)$			M1
		$5 \times 1000 - 6 \times 750$			M1 for complete method
			500	3	A1
					<b>Total 5 marks</b>

<b>6</b>	ai		B	3	B1
	aii		A		B1
	aiii		C		B1
	b		eg. cannot have a probability greater than 1	1	B1
	ci		rg, rp, wg, wp, bg, bp, yg, yp	3	B2 for all 8 with no repeats If not B2 then award B1 for at least 4 correct combinations (ignore incorrect and repeats)
	cii			$\frac{1}{8}$ oe	B1 ft from (i)
					<b>Total 7 marks</b>

<b>7</b>	a		14 squares shaded	1	B1
	b		$\frac{23}{100}$	1	B1
	c		0.06	1	B1
	d		86	1	B1
	e	0.14 × 350 oe			M1
			49	2	A1
					<b>Total 6 marks</b>

<b>8</b>	a		5	1	B1
	b		6	1	B1
	c		$3m + 11p$	2	B2 for $3m + 11p$ as final answer (NB. $3m + 11p = 14mp$ gets B1 only)  B1 for $3m$ or $11p$
	d		$4x + 10y$	2	B2 for $4x + 10y$ or $2(2x + 5y)$ as final answer (NB. $4x + 10y = 14xy$ gets B1 only)  B1 for $4x$ or $10y$
	e	$2 \times (-5)^2 + 6 \times -2$ or $2(-5)^2 + 6(-2)$ or 50 and -12			M1
				38	2
					<b>Total 8 marks</b>

<b>9</b>	a		kite	1	B1
	b		A, D	2	B2 B1 for A; B1 for D
	c		E, F	2	B2 B1 for E; B1 for F
	d		correct reflection drawn	1	B1
	e	$360 - (75 + 108 + 63)$ oe or $360 - 246$			M1
				114	2
					<b>Total 8 marks</b>

<b>10</b>	a		30	1	B1
	b		27	1	B1
	ci	line from (1215, 27) to (1315,27) and from (1315, 27) to (1430,0)		2	B2 If not B2 then B1 for line from (1215, 27) to (1315,27) <b>or</b> line from (1215 + x, 27) to (1330 + x, 0) x may be 0
	cii	"27" ÷ 1.25 <b>or</b> $\frac{27}{75} \times 60$		2	M1 Use of distance ÷ time -ft from (b); accept 27 ÷ 1.15 oe
			21.6		A1
					<b>Total 6 marks</b>

<b>11</b>	a		2	1	B1
	b	$(40 + 1) \div 2 (=20.5^{\text{th}})$ or $40 \div 2 (=20^{\text{th}})$			M1 or evidence of correct working by table <b>or</b> listing numbers to find median
			3	2	A1
	c	$0 \times 4 + 1 \times 3 + 2 \times 12 + 3 \times 5 + 4 \times 8 + 5 \times 5 + 6 \times 2 + 7 \times 1$ <b>or</b> $(0) + 3 + 24 + 15 + 32 + 25 + 12 + 7 (=118)$			M1 condone one error
		"118" ÷ "40"			M1 dep NB. Allow a value other than 40 provided it has clearly come from the sum of the frequency column
			2.95	3	A1 Accept 3 from $118 \div 40$ SC: B2 for 3.05
	d		$\frac{3}{40}$ oe	2	B2 Award B1 for $\frac{a}{40}$ $a < 40$ with <b>or</b> $\frac{3}{b}$ with $b > 3$
					<b>Total 8 marks</b>

<b>12</b>	a		multiples	1	B1
	bi		6, 12	1	B1 cao
	bii		2,3,4,6,8,9,10,12,14	1	B1 cao
	c		no members in common	1	B1 accept , e.g. members of <i>A</i> are even and members of <i>B</i> are odd; no numbers the same
					<b>Total 4 marks</b>

<b>13</b>	a	$60 \div 12 \times 150$ or $60 \div 12 (=5)$ or $150 \div 12 (=12.5)$			M1 allow $x \div 12 \times 60$ oe where $x$ is 300 or 250 or 100 or 2
			750	2	A1
	b	$625 \div 250 \times 12$ oe			M1 complete method
			30	2	A1
					<b>Total 4 marks</b>

<b>14</b>	<table border="1"> <tr> <td><math>x</math></td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td><math>y</math></td> <td>-11</td> <td>-8</td> <td>-5</td> <td>-2</td> <td>1</td> <td>4</td> </tr> </table>	$x$	-2	-1	0	1	2	3	$y$	-11	-8	-5	-2	1	4	$y = 3x - 5$ drawn from $x = -2$ to $x = 3$	4	<p>B4 For a correct line between <math>x = -2</math> and <math>x = 3</math></p>
	$x$	-2	-1	0	1	2	3											
	$y$	-11	-8	-5	-2	1	4											
					<p>B3 For a correct straight line segment through at least 3 of <math>(-2, -11)</math> <math>(-1, -8)</math> <math>(0, -5)</math> <math>(1, -2)</math> <math>(2, 1)</math> <math>(3, 4)</math>  <b>OR</b>  for all of <math>(-2, -11)</math> <math>(-1, -8)</math> <math>(0, -5)</math> <math>(1, -2)</math> <math>(2, 1)</math> <math>(3, 4)</math> plotted but not joined</p>													
				<p>B2 For at least 2 correct points plotted (ignore incorrect points)  <b>OR</b>  for a line drawn with a positive gradient through <math>(0, -5)</math> <b>and</b> clear intention to use a gradient of 3  (eg. a line through <math>(0, -5)</math> and <math>(0.5, -2)</math>)</p>														
				<p>B1 For at least 2 correct points stated (may be in a table) <b>or</b> may be shown in working eg. <math>3 \times 2 - 5 = 1</math>  <b>OR</b>  for a line drawn with a positive gradient through <math>(0, -5)</math> <b>but not</b> a line joining <math>(0, -5)</math> and <math>(3, 0)</math>  <b>OR</b>  a line with gradient 3</p>														
				<b>Total 4 marks</b>														

15	a	$\frac{9}{30} + \frac{4}{30}$		2	M1 for $\frac{9}{30}$ or $\frac{4}{30}$ <b>or</b> both fractions expressed as equivalent fractions with denominators that are a common multiple of 10 and 15 eg. $\frac{45}{150}$ and $\frac{20}{150}$
			shown		A1 conclusion to given answer coming from correct working
15	b	$\frac{21}{8} \div \frac{7}{6}$ <b>or</b> $\frac{21}{8}$ <b>and</b> $\frac{7}{6}$		3	M1 Both fractions expressed as improper fractions eg. $\frac{63}{24}$ , $\frac{28}{24}$
		$\frac{21}{8} \times \frac{6}{7}$ <b>or</b> $\frac{126}{56}$			M1 <b>or</b> for both fractions expressed as equivalent fractions with denominators that are a common multiple of 8 and 6 eg. $\frac{126}{48} \div \frac{56}{48}$ <b>or</b> $\frac{63}{24} \div \frac{28}{24}$
		shown		A1 conclusion to $2\frac{1}{4}$ or $\frac{9}{4}$ from correct working – either sight of the result of the multiplication e.g. $\frac{126}{56}$ must be seen or correct cancelling prior to the multiplication with $\frac{9}{4}$	
					<b>Total 5 marks</b>

16	a		$y(3y + 2)$	1	B1
	b				M1 for 3 correct terms <b>or</b> 4 correct terms ignoring signs <b>or</b> $x^2 - 7x + a$ for any non-zero value of $a$ <b>or</b> $\dots - 7x - 18$
			$x^2 - 7x - 18$	2	A1
ci	$6k < 20 - 5$				M1 for a correct first step to solve the inequality (accept an equation in place of an inequality) <b>or</b> 2.5 oe given as answer
		$k < 2.5$ oe		A1	final answer must be an inequality
cii		2	3	B1	for 2 <b>or</b> ft from an incorrect inequality of the form $k < a$ in (i)
<b>Total 6 marks</b>					

17	$\sin 53^\circ = \frac{AB}{13.4}$ or $\frac{\sin 53}{AB} = \frac{\sin 90}{13.4}$ or $\frac{AB}{\sin 53} = \frac{13.4}{\sin 90}$ or $\cos 37 = \frac{AB}{13.4}$			M1	<b>Alternative methods</b> M1 for AC or angle B evaluated correctly <b>AND</b> then used in a correct method to find AB  eg. $AB^2 + 8.06..^2 = 13.4^2$ , $\tan 53 = \frac{AB}{8.06..}$
	$13.4 \times \sin 53^\circ$ or $\frac{13.4}{\sin 90} \times \sin 53$ or $13.4 \times \cos 37$			M1	M1 for a fully correct method eg.; $\sqrt{13.4^2 - 8.06..^2}$ , $8.06... \times \tan 53$
		10.7	3	A1	awrt 10.7
<b>Total 3 marks</b>					

18	$6000 \div (2 + 3 + 7) \times 7 (=3500)$ or $6000 \div (2 + 3 + 7) \times 2 (=1000)$			M1	
	$\frac{3}{5} \times "3500" (=2100)$			M1	
	$(6000 \div (2 + 3 + 7) \times 2) + \frac{3}{5} \times "3500" (=3100)$ or $1000 + 2100$			M1	
	$\frac{"3100"}{6000} \times 100$			M1	dep on previous M1
		52	5	A1	Accept 51.6 - 52
<b>Total 5 marks</b>					

<b>19</b>	$\pi \times 2.5^2 (=19.6\dots)$ <b>or</b> $13.8 \times 7.6 (=104.88)$			M1
	$13.8 \times 7.6 - \pi \times 2.5^2$			M1 correct method
		85.2	3	A1 for answer in range 85 – 85.3
				<b>Total 3 marks</b>

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