Pearson

Mark Scheme (Results)

January 2017

Pearson International GCSE Mathematics A 4MA0/1F

edexcel

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please visit our website at www.edexcel.com.

Our website subject pages hold useful resources, support material and live feeds from our subject advisors giving you access to a portal of information. If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

www.edexcel.com/contactus

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2017
Publications Code 4MA0_1F_1701_MS

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 15c, 19 & 21b (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**
1	(a)		22.7	1	B1
	(b)		arrow pointing to 5.26	1	B1
					Total 2 marks

2	(i)		factor	1	B1
	(ii)		square	1	B1
	(iii)		prime	1	B1
	(iv)		multiple	1	B1
					Total 4 marks

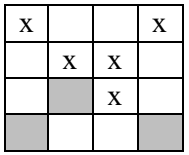
3	(a)		4	1	B1
	(b)			2	B1ft 4 ‘men’ for 2 children,
			correct pictogram		B1ft 2.5 ‘men’ for 3 children.
	(c)		58	1	B1
	(d)			2	M1 24:16 or equivalent but not 3:2 **or** 2 : 3
			3:2		A1 accept 1.5 : 1 **or** 1 : $\frac{2}{3}$
					Total 6 marks

4	(a)		120	1	B1	
	(b)		Three thousand, eight hundred and twenty one	1	B1	
	(c)		81	1	B1	
	(d)		3142	1	B1	
						Total 4 marks

5	(i)		*C*	1	B1	
	(ii)		*D*	1	B1	
	(iii)		*A*	1	B1	
						Total 3 marks

6	(a) (i)		33	1	B1	
	(ii)		Correct statement	1	B1	eg +6, added 6 to the previous term **or** $6n - 3$
	(b)		31	1	B1	
						Total 3 marks

7	(a)		42	1	B1	
	(b)		49	1	B1	
	(c) (i)		89	2	B1ft	Correct angle, ft (138−'*y*')
	(ii)		(Angles) in a triangle add up to 180°		B1	Or exterior angle of a triangle is equal to the sum of the two opposite interior angles
						Total 4 marks

8	(a)		A vertical and horizontal axis of symmetry and no extra lines.	1	B1	
	(b)			1	B1	5 cells shaded
	(c)		A kite, delta or an isosceles trapezium.	1	B1	
						Total 3 marks

9	(a)		0.00679, 0.0632, 0.607, 0.615, 0.66	1	B1	
	(b)			2	M1	$\frac{24}{80}$ oe
			$\frac{3}{10}$		A1	cao
	(c)		0.09	1	B1	
	(d)		57	1	B1	
	(e)	$\frac{2}{9} \times 18.54$ **or** 2.06 **or** $\frac{103}{25}$ **or** 0.22(2…) × 18.54 oe		2	M1	
			4.12		A1	
	(f)	$\frac{27}{100} \times 4600$ oe (= 1242)		3	M1	M2 for 1.27 × 4600
		4600 + '1242'			M1 dep	
			5842		A1	
						Total 10 marks

10	(a)		−30	1	B1	
	(b)	24 ÷ 3 + 8		2	M1	for an inverse operation (+8 or ÷3)
			16		A1	16
						Total 3 marks

11			2	M1	for triangle with $AC = BC$ with relevant arcs **or** $AC = 5$ cm or $BC = 5$ cm with relevant arcs **or** correct triangle with no arcs
		A correct triangle		A1	A correctly drawn triangle with relevant arcs at C (vertex within intersection on overlay)
					Total 2 marks

12	(a)			2	M1	For at least 3 correct combinations or for all correct with repeats
			TB, TP, CB, CP, JB, JP		A1	All correct and no repeats
	(b)	3 × 1.65 (=4.95) **or** 4 × 3.10 (=12.40) **or** 17.35		3	M1	
		20 – 3 × 1.65 − 4 × 3.10 oe			M1	allow 20 – a × 1.65 − b × 3.10 oe where a and b are both either 3 or 4
			2.65		A1	accept £2.65p
						Total 5 marks

13	(a)			2	M1	$7x$ or $-3y$
			$7x - 3y$		A1	
	(b)		$24t^2$	1	B1	
	(c)		$h(7 + h)$	1	B1	
						Total 4 marks

14	(*HD/JG* =) 12 ÷ 3 (=4)		4	M1	could be on diagram and may be part of a calculation eg 4×3=12
	(*EB / JF / GC* =) 10 – 3 (=7) **or** (*AH* / *EJ* / BF=) 10 – "4" (=6)			M1	could be on the diagram
	10 × 10 – 3 × "6" – "4" × "7" – 12 **or** (10 – "4") ×"7"			M1ft	dep on M2
		42		A1	cao
					Total 4 marks

15	(a)		4	1	B1	
	(b)	8 × 1024		2	M1	For 8 (from 2^3) **or** 1024 **or** 2 × 2 × 2 × 4 × 4 × 4 × 4 × 4
			8192		A1	accept 2^{13}
	(c)	600 = 2 × 300 = 2 × 2 × 150 = 2 × 2 × 2 × 75 = 2 × 2 × 2 × 3 × 25 = 2 × 2 × 2 × 3 × 5 × 5		3	M1	For at least 2 correct steps in repeated factorisation (may be seen in a tree diagram)
					A1	for correct factors E.g.2, 2, 2, 3, 5, 5 (condone inclusion of 1)
			$2^3 \times 3 \times 5^2$		A1	NB: Candidates showing no working score 0 marks.
						Total 6 marks

16	3×7 (=21)		2	M1	**or** for 3 numbers with a total of 21 **or** 3 numbers with a median of 5 **or** 3 numbers with a range of 14 **or** $(a + c =) 3 \times 7 - 5$ (=16)
		1, 5, 15		A1	numbers can be in any order
					Total 2 marks

17	$\pi \times (70 - 2 \times 15)$ **or** $\pi \times 40$ (=125(.6…))		4	M1	oe
	4×15 (=60) **and** 4×70 (=280) **or** 340			M1	independent
	"125.6..." + "60" + "280"			M1	dep on M2
		466		A1	for answer in range 465.6 – 466
					Total 4 marks

18	96 ÷ 3 (= 32)		3	M1	M2 for $\frac{5}{3}\times 96$
	9 × '32'(=288) **or** 4 × '32'(=128) **or** (9 − 4) × '32'			M1 dep	
		160		A1	
					Total 3 marks

19	$\frac{17}{3} - \frac{19}{5}$		3	M1	for correct improper fractions (subtraction sign not necessary) **OR** two improper fractions with a common denominator with at least one of the fractions correct
	E.g. $\frac{85}{15} - \frac{57}{15}$ **or** $\frac{17\times5-3\times19}{15}$ oe			M1	for correct fractions with a common denominator a multiple of 15 i.e. in form $\frac{85a}{15a} - \frac{57a}{15a}$
		shown		A1	dep on M2 for correct conclusion to $1\frac{13}{15}$ from correct working **with** sight of the result of the subtraction e.g. $\frac{28}{15}$
	Alternative method				
	$(5)\frac{10}{15} - (3)\frac{12}{15}$		3	M1	for two correct fractions with a common denominator a multiple of 15
	$-\frac{2}{15}$			M1	
		shown		A1	dep on M2 for correct conclusion to $1\frac{13}{15}$ from correct working **with** sight of the result of the subtraction e.g. $\frac{28}{15}$ or $2 - \frac{2}{15}$
	Alternative method				
	E.g. $5\frac{10}{15} - 3\frac{12}{15}$		3	M1	for two correct fractions with a common denominator a multiple of 15
	E.g. $4\frac{25}{15} - 3\frac{12}{15}$			M1	for a complete correct method
		shown		A1	dep on M2 for correct conclusion to $1\frac{13}{15}$ from correct working
					Total 3 marks

20	(a)	(−1, 6) (0, 4) (1, 2) (2, 0) (3, −2) (4, −4) (5, −6)	Correct line between $x = -1$ and $x = 5$	4	B4	For a correct line between $x = -1$ and $x = 5$
					B3	For a correct line through at least 3 of (−1, 6) (0, 4) (1, 2) (2, 0) (3, −2) (4, −4) (5, −6) **OR** for all of **(**−1, 6) (0, 4) (1, 2) (2, 0) (3, −2) (4, −4) (5, −6) plotted but not joined.
					B2	For at least 2 correct points plotted
					B1	For at least 2 correct points stated (may be in a table) or seen in working **OR** for a line drawn with a negative gradient through (0, 4) **OR** for a line with the correct gradient.
	(b)			3	M1	for $y = -4$ drawn; accept full or dashed line NB A shaded rectangle implies a choice of lines so M0
					M1	for $x = 1$ drawn; accept full or dashed line NB A shaded rectangle implies a choice of lines so M0
			For correct region identified		A1ft	for correct region identified. Condone no label if region clear. ft from an incorrect straight line in part (a)
						Total 7 marks

21	(a)	$5y = 10 - 17$ **or** $5y = -7$ **or** $17 - 10 = -5y$ **or** $7 = -5y$		2	M1	
			-1.4		A1	for -1.4 or $-\frac{7}{5}$ or $-1\frac{2}{5}$
	(b)	$5q - 15$ $(= 12 - q)$ **or** $q - 3 = \frac{12}{5} - \frac{q}{5}$		3	M1	
		E.g. $5q + q = 12 + 15$ **or** $6q = 27$			M1	For a correct equation with the q terms collected on one side of the equation and the non q terms on the other side. ft from $5q - 3 = 12 - q$ for this mark only
			4.5		A1	for 4.5 **or** $\frac{9}{2}$ oe dep on at least M1
	(c)	$-7t \geq 31 - 3$ or $7t \leq 3 - 31$ oe		2	M1	$-7t \geq 31 - 3$ **or** $7t \leq 3 - 31$ **or** -4 **or** $t \geq -4$ accept an equation or the wrong inequality sign
			$t \leq -4$		A1	or for $-4 \geq t$
						Total 10 marks

22 (a)	$18 \div 60$ oe **or** 7.3 **or** $7\frac{18}{60}$ **or** $7\frac{3}{10}$ **or** $7 \times 60 + 18$ (=438)		3	M1	for changing time to a decimal (7.3)
	$750 \times$ "7.3" oe **or** $750 \times \frac{"438"}{60}$ oe			M1	for speed × time (allow 750×7.18 **or** answer of 5385)
		5475		A1	
(b)	for at least one correct operation eg. 750×1000, $750 \div 60$ **or** $\frac{1000}{60 \times 60}$ (= 0.27....) **or** $\frac{5}{18}$		3	M1	for **one or two** of ×1000, ÷60, ÷60 (can be implied by 750 000 **or** 12.5 **or**12500 **or** 0.2083)
	$\frac{750 \times 1000}{60 \times 60}$ oe			M1	complete correct method
		208		A1	accept answers in range 208 – $208.\dot{3}$
	Alternative mark scheme ft from (a)				
	"5475" × 1000 (=5475000) **OR** $7 \times 60 + 18 = 438$ **and** 438×60 (=26280 (sec))		3	M1	
	"5475000" ÷ 26280			M1	dep complete correct method
		208		A1	accept answers in range 208 – $208.\dot{3}$
					Total 6 marks

23	(a)		$5 < d \leq 10$	1	B1	accept 5 – 10
	(b)	$2.5 \times 28 + 7.5 \times 32 + 12.5 \times 20 + 17.5 \times 14 + 22.5 \times 6$ **or** $70 + 240 + 250 + 245 + 135$ **or** 940		4	M2	$f \times d$ for at least 4 products with correct mid-interval values **and** intention to add If not M2 then award M1 for d used consistently for at least 4 products within interval (including end points) **and** intention to add **or** for at least 4 correct products with correct mid-interval values with no intention to add
		$(2.5 \times 28 + 7.5 \times 32 + 12.5 \times 20 + 17.5 \times 14 + 22.5 \times 6) \div 100$ **or** $(70 + 240 + 250 + 245 + 135) \div 100$ **or** "940" ÷ 100			M1	dep on M1 NB: accept their 100 if addition shown
			9.4		A1	SC: B2 for answer of 9.44 (B1 for 944 in working)
						Total 5 marks

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom