Mark Scheme (Results)

Summer 2014

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

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

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.

Apart from Question 23a, where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question	Working	Answer	Mark	Notes
1 (a)		36	1	B1
(b)		2 correct icons in Week 4	1	B1
(c)	"36" + 12 + 6 + 24 oe	78	2	M1 A1 ft
				Total 4 marks

Question	Working	Answer	Mark	Notes
2 (a)		(Triangular) prism	1	B1 for prism or triangular prism
(b)		9	1	B1
(c)		60	1	B1 (tolerance of $\pm 2^{o}$)
				Total 3 marks

Question	Working	Answer	Mark	Notes
3 (a)		100	1	B1
(b)		0.1	1	B1
				Total 2 marks

Question	Working	Answer	Mark	Notes
4 (a)		86200	1	B1
(b)		5959	1	B1
(c)	$2186890 \div (32 + 26)$		2	M1 $2186890 \div (32 + 26)$
		37705		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
5 (a)		23	1	B1
(b)	$(-5 - 3) \div 4$		2	M1
		-2		A1
(c)		$y = 4x + 3$	2	B2 for $y = 4x + 3$ oe
				If not B2 then B1 for $4x + 3$ **or** $x = (y - 3) \div 4$
				Total 5 marks

Question	Working	Answer	Mark	Notes
6 (a)		Ethiopia, Kenya	1	B1
(b)		$\dfrac{3}{7}$	1	B1
(c)	GB $4 \times 3 + 1 \times 2 + 1 \times 1 = 15$ Ger $1 \times 3 + 4 \times 2 + 3 \times 1 = 14$		2	M1 $4 \times 3 + 1 \times 2 + 1 \times 1$ or $1 \times 3 + 4 \times 2 + 3 \times 1$ or $(4\text{-}1) \times 3 - (4\text{-}1) \times 2 - (3\text{-}1) \times 1$
		1		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
7	4 × 0.43 + 4 × 0.75 = 4.72 5 - 4.72	 0.28	3	M1 4 × 0.43 + 4 × 0.75 M1 5 - 4.72 A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
8 (a)		Correct reflection	2	B2 If not B2 then B1 for a reflection in a line parallel to the mirror line OR B1 for at least 4 out of 6 vertices correct
(b)	$\frac{2}{5} \times 10$ **or** $\frac{4}{10}$	4	2	M1 A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
9 (a)		Andorra la Vella	1	B1 accept −7
(b)		9	1	B1 accept −9
(c)	6 - 2 × 6.5 or 6 - 13	-7	2	M1 allow for 2×6.5 − 6 **or** 6 + 2×6.5 A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
10 (a)	$\dfrac{40}{100} \times 20$		2	M1 $\dfrac{40}{100} \times 20$ oe
		8		A1
(b)	43%, 42.8.%, 43.8%, 43.75%		2	M1 Convert at least 2 of the 3 correctly to percentages or decimals
		$\dfrac{3}{7}$ 0.43 $\dfrac{7}{16}$ 43.8%		A1 correct order. Accept written in any correct form.
				SC: Award B1 (1 mark only) if ordered largest to smallest
				Total 4 marks

Question	Working	Answer	Mark	Notes
11 (a)		$7x$	1	B1
(b)		$15y$	1	B1
(c)(i)	$5 \times (-4) - 4 \times 3 = -20 - 12$		5	M1 $5 \times (-4) - 4 \times 3$
		-32		A1
(c)(ii)	eg. $-22 = 5 \times p - 4 \times -5$ **or** $5p = -22 + 4 \times -5$			M1 for correct substitution (must be into a correct equation)
	eg. $-22 = 5p + 20$ **or** $5p = -22 - 20$ **or** $p = \dfrac{-22 - 20}{5}$			M1 for correct simplification (minimum of $-4 \times -5 = +20$)
		-8.4 oe		A1 (accept $-\dfrac{42}{5}$ or $-8\dfrac{2}{5}$ oe)
				Total 7 marks

Question	Working	Answer	Mark	Notes
12 (a)		4.8	1	B1
(b)	6 US g = 5 Canadian g 4.5 × 5		2	M1 for a complete method eg 6 USg = 5 Canadian g **and** (27 ÷ 6) × 5
		21 - 25		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
13 (a)		Obtuse	1	
(b)(i)		27	2	B1
(b)(ii)		Vertically opposite		B1 (Vertically) opposite angles are equal
(c)	Angle *ZYD* = 180 - 120 - 27		2	M1 for 180 - 120 - '27' or angle *ZYD* = 180 - 120 - '27' or angle *CYZ* = 120 + 27 or angle *CYX* = 180 - 120 - 27
		33		A1
				Total 5 marks

Question	Working	Answer	Mark	Notes
14 (a)		1505	1	B1
(b)	0937 + 45	1022	2	M1 0937 + 45 A1
(c)		3 h 27 min	1	B1 3h 27 min (accept 207 min)
(d)	3.45 **or** $3\frac{27}{60}$		3	M1 for correctly converting '3h 27m' into a decimal (e.g. 3.45) For '3h 27m' there must be some indication that this is the elapsed time from 20:07 to 23:34 or ft from (c)
	$"3\frac{27}{60}" \times 224$ **or** "3.45" $\times 224$			M1 (independent) allow '3h 27m' $\times$ 224 **or** 3.27 $\times$ 224 For '3h 27m' there must be some indication that this is the elapsed time from 20:07 to 23:34 or ft from (c) NB. 224 $\times$ 20 07 gets M0
		772.8		A1 accept 773
				Total 7 marks

Question	Working	Answer	Mark	Notes
15 (a)	(360 - 96 - 84 - 36) ÷ 2 = 72	$\dfrac{72}{360}$	2	M1 (360 - 96 - 84 - 36) ÷ 2 A1 oe
(b)	$\dfrac{360}{96} \times 48$		2	M1 $\dfrac{360}{96} \times 48$
		180		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
16	1 can of soup weighs 0.8 ÷ 4 = 0.2 kg		4	M1 for 0.8 ÷ 4 **or** 0.2 **or** 0.6
	4 jars of peppers weigh 4.1 - 3 ×0.2 kg = 3.5 kg			M1 for 4.1 - 3× "0.2" (=0.35)
	1 jar of peppers weigh 3.5 ÷ 5			M1 for "3.5" ÷ 5
		0.7		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
17 (a)		19	1	B1
(b)		41	1	B1
(c)	(88 - 1) ÷ 3		2	M1 $3n + 1 = 88$ or (88 - 1) ÷ 3 or $2n + 1 + n = 88$ or 19, 22, 25, 28, 31, 34.........
		29		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
18 (a)		Rotation, 90°, anticlockwise, centre *O*	3	B1 Rotate **or** rotated B1 90° (anticlockwise) **or** −270° **or** 270° clockwise B1 (centre) *O* **or** (0,0) **or** origin (do **not** accept $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$ but do not count as an additional transformation) **NB** if more than one transformation then 0 marks
(b)		triangle at (6,1) (7,1) (7,3)	1	B1 cao
				Total 4 marks

Question	Working	Answer	Mark	Notes
19	$\pi \times 3^2$ (= 9π) (= 28.27...)			M1 rounded or truncated to 3 or more sig figs
	20 × 12 (= 240)			M1
	"240" − 2 × "28.27…"			M1 dep on M2
		183	4	A1 for 183 – 184
				Total 4 marks

Question	Working	Answer	Mark	Notes
20	**Working with all 12 boxes** 12×15 (=180) **or** 12×12 (=144)			M1 for correct total cost or correct total number of drinks (either may appear as part of another calculation)
	$12 \times 12 \times \dfrac{3}{4} \times 1.5$ oe (=162)			M1 for revenue from all full price drinks sold
	$12 \times 15 \times 1.15$ oe (=207) **or** 180×0.15 oe (=27)			M1 for total revenue or total profit
	$\dfrac{"207"-"162"}{36}$ **or** $\dfrac{45}{36}$ **or** $\dfrac{"27"+("180"-"162")}{36}$			M1 dep on M3
		1.25	5	A1 cao
	Alternative – working with one box $15 \div 12$ (=1.25) **or** $12 \times \dfrac{3}{4}$ (= 9)			M1 for price of 1 drink **or** number of full price drinks
	$12 \times \dfrac{3}{4} \times 1.5$ oe (= 13.5)			M1 for revenue from all full price drinks sold
	15×1.15 (=17.25)			M1 for total revenue from one box
	$\dfrac{"17.25"-"13.5"}{3}$ **or** $\dfrac{3.75}{3}$			M1 dep on M3
		1.25	5	A1 cao
				Total 5 marks

Question	Working	Answer	Mark	Notes
21 (a)		0.9	1	B1 accept 90% or $\dfrac{9}{10}$ oe
(b)	50×0.1	5	2	M1 50×0.1 A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
22 (a)	$252 = 2 \times 126 = 2 \times 2 \times 63 = 2 \times 2 \times 3 \times 21$		2	M1 for a process that isolates at least 2 correct prime factors e.g. $252 = 2 \times 126$, $126 = 3 \times 42$ or a factor tree with 2 primes from 2, 3 or 7 identified or repeated division
		2×2×3×3×7		A1 for 2×2×3×3×7 oe with correct prime factors
(b)	$2^2 \times 3^2 \times 7 \times 2^4 \times 3 \times 5$			M1 "$2^2 \times 3^2 \times 7$" $\times 2^4 \times 3 \times 5$ or a fully correct factor tree or fully correct repeated division
		$2^6 \times 3^3 \times 5 \times 7$	2	A1 cao accept in any order eg $3^3 \times 2^6 \times 7 \times 5$
				Total 4 marks

Question	Working	Answer	Mark	Notes
23 (a)	$x + 24 = 4x - 30$			M1 for forming a correct equation in x
		$x = 18$		A1 cao
	$x + 2y + x + 24 = 180$ or $x + 2y + 4x - 30 = 180$ or $x + 2y + 4x - 30 + x + 24 + x + 2y = 360$			M1 for forming a correct equation in x and y **or** a correct equation in y (NB. Their found value of x (which may not be correct) may be substituted)
		$y = 60$	4	A1 cao
(b)		42	1	B1 ft "x" + 24
				Total 5 marks

Question	Working	Answer	Mark	Notes
24 (a)	$2.1 \div (1 + 2 + 3) \ (= 0.35)$ **or** $2.1 \div 6$ $2.1 \div (1 + 2 + 3) \times 2$ **or** $2.1 \div 6 \times 2$ oe			M1 allow $2.1 \div (1 + 2 + 3) \times 3 \ (=1.05)$ for the method mark
		0.7	2	A1 (accept 0.70)
(b)	eg. $6 \div 3 = 2$ **and** 2×0.75 **or** $\dfrac{0.75}{3} \times 6$ oe			M1 for a complete method
		1.5	2	A1 cao
				Total 4 marks

TOTAL FOR PAPER: 100 MARKS