edexcel

Mark Scheme (Results)

January 2012

International GCSE Mathematics (4MA0) Paper 2F

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 call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our qualifications website at www.edexcel.com. For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at www.btec.co.uk.

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.

Ask The Expert can be accessed online at the following link:

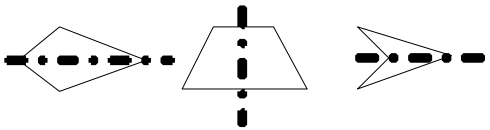
http://www.edexcel.com/Aboutus/contact-us/

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 raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2012
Publications Code UG030744

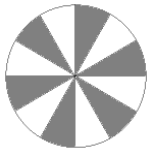
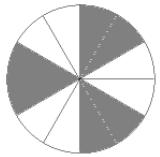
Apart from Question 15 (where the mark scheme states otherwise), the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.				
Question	Working	Answer	Mark	Notes
1. (a)		$2.5 < \text{ans} < 3$	1	B1
(b)		National Gallery	1	B1
(c)		$3.5 < \text{bar} < 4$	1	B1
(d)		Tate Modern	1	B1
				Total 4 marks

2. (a)		Freetown	1	B1
(b)	one thousand, two hundred and three		1	B1 Accept 1 for 'one', 2 for 'two' and 3 for 'three'. Condone omission of 'and'
(c)		tens	1	B1 Also accept 10, 40
(d)		3440	1	B1 cao
(e)		1920	1	B1 cao
(f)		2443 2415	2	B2 B1 for each number
(g)		1.92(0)	1	B1
				Total 8 marks

3. (a)(i)		isosceles	2	B1	Condone spelling errors
(ii)		line of symmetry		B1	
(b)(i)		drawing of kite or isosceles trapezium or arrowhead (dart, deltoid)	3	B1	
(ii)		line of symmetry		B1	Award for clear attempt to draw a line which passes through *A* and the midpoint of *BC*.
(iii)		correct name of their shape		B1	dep on first B1 Accept any recognisable spelling (Condone omission of 'isosceles')
					Total 5 marks

4. (a)		35 32	2	B1	for each number
(b)	eg took away 3, subtracted 3, 3 less		1	B1	
(c)		8	1	B1	cao
(d)	eg 50 is not a multiple of 3, 3 is not a factor of 50, 2 is in the sequence, −1 is in the sequence		1	B1	
					Total 5 marks

5. (a)		$\frac{2}{3}$	1	B1	cao
(b)	48 ÷ 6 or 8 or 5 × 48 or 240		2	M1	
		40		A1	cao
(c)	7 ÷ 8		2	M1	
		0.875		A1	Accept 0.88
					Total 5 marks

6.	(a)(i)		4	2	B1	cao
	(ii)		2		B1	cao
	(b)(i)		eg 	2	B1	for a correct diagram
	(ii)		eg 		B1	for a correct diagram Accept diagram with rotational symmetry of order 3 and 3 sectors shaded
						Total 4 marks

7.	(a)		hundredths	1	B1	Accept 0.01, $\frac{1}{100}$, 0.07, $\frac{7}{100}$
	(b)		0.08 0.1 0.12 0.18	1	B1	
	(c)		2.8	1	B1	
	(d)		3.1	1	B1	
	(e)		7	1	B1	
						Total 5 marks

8.	$\frac{2+9+7+3+6+8+9+8}{8}$ or $\frac{"52"}{8}$		2	M1	for clear attempt to add and divide by 8	*SC* If M0, award B1 for 45
		6.5		A1	for 6.5 oe	
						Total 2 marks

9.	(a)	$3 \times 2 + 4 \times 5$ or $6 + 20$		2	M 1	for correct substitution
			26		A1	cao
	(b)	$-12 + 14$		2	M 1	for correct evaluation of one term ie -12 or 14
			2		A1	cao
	(c)	$9 = 3d + 4 \times 6$		3	M 1	for correct substitution
		$3d = 9 - 24$ or $3d = -15$			M 1	for correct rearrangement
			-5		A1	cao Award 3 marks for correct answer
						Total 7 marks

10.	(i)	2000 ÷ 72 or 200 ÷ 7.2 or 2 ÷ 0.072 or 27.77…		5	M 2	M1 for 2 ÷ 72 or 0.0277… or for division with incorrect conversion(s) eg 200 ÷ 72 or 2.77… 20 ÷ 72 or 0.277… 2 ÷ 0.72 or 2.77...
			27		A1	cao
	(ii)	"2000"–"27"×"72" or 2000 − 1944 or 0.777…× 72			M 1	Their "27" must be a whole number.
			56		A1	cao
						Total 5 marks

11.	$\frac{4.2}{1.12}$		2	M1 for 4.2 or 1.12 or 0.6 or $\frac{15}{4}$
		3.75		A1
				Total 2 marks

12.	$(\angle ABD =)\ 60°$		4	B1 May be stated or marked on diagram
	$(\angle DBC =)\ \frac{180° - 78°}{2}$			M1
	$51°$			A1 May be stated or marked on diagram
		111		A1
				Total 4 marks

13.	1 7 7		3	B2 for 1 7 7 in any order B1 for three positive whole numbers with either a median of 7 or a sum of 15 SC B1 for 0 7 8 in any order
		6		B1 cao
				Total 3 marks

14.	$\frac{135}{180}$		3	M1
	0.75 oe			A1
		45		A1 cao
				Total 3 marks

15.	$4x = 7$ or $4x = 2 + 5$ or $7x - 3x = 7$ oe or $4x - 7 = 0$ oe		3	M 2	for correct rearrangement with x terms on one side and numbers on the other AND collection of terms on at least one side or for $4x - 7 = 0$ oe M1 for $7x - 3x = 2 + 5$ oe ie correct rearrangement with x terms on one side and numbers on the other
		$1\frac{3}{4}$ oe		A1	Award full marks for a correct answer if at least 1 method mark scored
					Total 3 marks

16. (a)(i)		1	4	B1	Also accept $\frac{1}{1}$, $\frac{8}{8}$, 100%	
(ii)		$\frac{1}{8}$		B1		
(iii)		$\frac{2}{8}$ or $\frac{1}{4}$		M 1 A1	for denominator of 8 for numerator of 2	*SC* B2 for $\frac{1}{4}$
(b)	$\frac{3}{8} + \frac{2}{8}$ oe		2	M 1		
		$\frac{5}{8}$		A1		
						Total 6 marks

17.	One correct point plotted or stated		4	B1	May appear in table	
	2nd correct point plotted or stated			B1	May appear in table	
	Correct line between $x = -2$ and $x = 4$			B2	B1 for a line joining two correct, plotted points	
					Total 4 marks	

18. (a)	1 + 7 or 8		2	M 1	8 may be denominator of fraction or coefficient n in an equation such as $8x = 32$	*SC* If M0 A0, award B1 for 4 : 28
		28		A1	cao	
(b)	32 × 45 or 1440 or 14.4(0)m		3	M 1		
	$\frac{\text{"1440"}}{72}$			M 1	dep	
		20		A1	cao	
					Total 5 marks	

19. (a)		Rotation	3	B1		These marks are independent but award no marks if the answer is not a single transformation
		90°		B1	Also accept quarter turn or −270° (B0 for 90° clockwise)	
		(0, 0)		B1	Also accept origin, *O*	
(b)		**R** correct	1	B1		
					Total 4 marks	

20.	Fully correct factor tree or repeated division or 2, 2, 2, 5, 5 or $2 \times 2 \times 2 \times 5 \times 5$		3	M 2	M1 for factor tree or repeated division with 2 and 5 as factors
		$2^3 \times 5^2$		A1	Also accept $2^3.5^2$
					Total 3 marks

21.	(a)		c^7	1	B1	cao
	(b)	$y^{3+n-1} = y^6$ oe or $y^{3+n} = y^7$ oe or $3 + n - 1 = 6$ oe or $y^n = \frac{y^7}{y^3}$ or $y^n = \frac{y^6}{y^2}$ or $y^n = y^4$		2	M 1	*SC* if M0, award B1 for an answer of y^4
			4		A1	cao
						Total 3 marks

22.	(a)	Complete, correct expression which, if correctly evaluated, gives 48 eg $4 \times \frac{1}{2} \times 6 \times 4$, $2 \times \frac{1}{2} \times 12 \times 4$, $\frac{1}{2} \times 12 \times 8$		3	M 2	M1 for correct expression for area of one relevant triangle eg $\frac{1}{2} \times 6 \times 4$, $\frac{1}{2} \times 8 \times 6$, or $\frac{1}{2} \times 12 \times 4$
			48		A1	cao
	(b)	$4^2 + 6^2 = 16 + 36 = 52$		3	M 1	for squaring and adding
		$\sqrt{4^2 + 6^2}$			M 1	(dep) for square root
			7.21		A1	for answer which rounds to 7.21 (7.211102…)
						Total 6 marks

23.	(i)		$-1\frac{1}{2} < x \leq 2$	4	B2 Also accept $-\frac{3}{2} < x \leq 2$ or answer expressed as two separate inequalities B1 for $-1\frac{1}{2} < x$ or $-\frac{3}{2} < x$ or $x \leq 2$ (these may be as part of a double-ended inequality) or $-\frac{6}{4} < x \leq \frac{8}{4}$
	(ii)		$-1 \quad 0 \quad 1 \quad 2$		B2 B1 for 4 correct and 1 wrong or for 3 correct and 0 wrong
					Total 4 marks

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email publication.orders@edexcel.com
Order Code UG030744 January 2012

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE