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Mark Scheme (Results)

January 2012

International GCSE Mathematics (4MA0) Paper 2F

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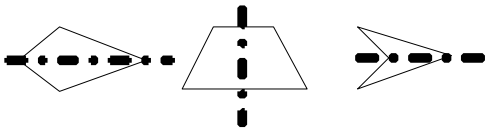
Apart from Question 15 (where the mark scheme states otherwise), the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

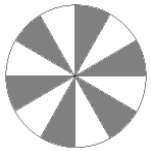
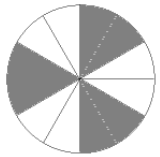
Question	Working	Answer	Mark	Notes
1. (a)		$2.5 < \text{ans} < 3$	1	B1
(b)		National Gallery	1	B1
(c)		$3.5 < \text{bar} < 4$	1	B1
(d)		Tate Modern	1	B1
				Total 4 marks

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	M1	for correct substitution
			26		A1	cao
	(b)	$-12 + 14$		2	M1	for correct evaluation of one term ie -12 or 14
			2		A1	cao
	(c)	$9 = 3d + 4 \times 6$		3	M1	for correct substitution
		$3d = 9 - 24$ or $3d = -15$			M1	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	M2	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			M1	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

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