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Mark Scheme Summer 2009

IGCSE

IGCSE Mathematics (4400)

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4400 Paper 1F Mark Scheme

Except for questions* where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method. [* Questions 15(b) and 18(b)]

Q	Working	Answer	Mark	Notes	
1 a		6012	1	B1	cao
b		6800	1	B1	cao
c		tens	1	B1	Accept 80, 10, T
d		803	1	B1	cao
					Total 4 marks

2 a		54 63	2	B2	B1 each
b	eg Add 9, multiples of 9, 9 times table		1	B1	
c		180	1	B1	cao
					Total 4 marks

3 ai		9 40 pm	2	B1	Allow 20 to 10 pm
ii		21 40		B1	cao
b		−2	1	B1	cao
c		−8 indicated	1	B1	Allow $\pm$ ½ division
					Total 4 marks

4	a		75	1	B1	cao
	b		USA	1	B1	Accept any clear indication
	c		bar	1	B1	Accept 25 < bar < 30
						Total 3 marks

5	ai		line	2	B1	
	ii		isosceles		B1	
	b		lines	2	B2	for 4 correct B1 for 2 correct
	ci		octagon	2	B1	
	ii	eg angles not all equal			B1	
	di		0	2	B1	cao
	ii		2		B1	cao
	ei		$\frac{2}{5}$	2	B1	cao
	ii		0.4		B1	ft from (i) if denominator is 3 or 5 but not if denominator is 2 or 4 If (i) is "$\frac{2}{3}$" (ii) must be $0.\dot{6}$ oe or have at least 2 decimal places rounded or truncated
						Total 10 marks

6	ai		22 24	4	B1	cao
	ii		28		B1	cao
	iii		25		B1	cao
	iv		23 or 29		B1	
	bi		$\frac{1}{9}$	3	B1	
	ii		$\frac{5}{9}$		M1 A1	denominator 9 numerator 5
						Total 7 marks

7	ai		2.645751311	2	B1	for at least 5 figures
	ii		2.65		B1	ft from "2.645…" if at least 3 dp
	bi		0.0841	2	B1	cao
	ii		0.08		B1	ft from "0.0841" if of equal difficulty
	c	3.375 + 0.4		2	M1	for 3.375 or 0.4
			3.775		A1	cao
						Total 6 marks

8	a	1 4 4 5 6 10 10 10 10 10 or $\frac{10+1}{2}$ or $5\frac{1}{2}$ or 6, 10		2	M1	for a clear attempt to list in order
			8		A1	cao
	b		9	2	B2	B1 for 1-10, 10 − 1
						Total 4 marks

9	a		$4q$	1	B1	Accept $4\times q$, $q4$ etc
	b		$5np$	1	B1	Do not accept $\times$ signs Accept $n5p$, $5pn$, $5(pn)$ etc
	c		7	1	B1	cao
	d	$8y = 5 + 1$ or $8y = 6$		2	M1	May be implied by correct answer
			¾ oe		A1	
						Total 5 marks

10	a	eg 0.666…, 0.7, 0.65, 0.625		2	B2	for $\frac{5}{8}\ \frac{13}{20}\ \frac{2}{3}\ \frac{7}{10}$ or for correct decimal equivalents B1 for 3 fractions in correct order or for 2 fractions correctly converted to decimals (at least 2 dp rounded or truncated) or for 2 fractions expressed as equivalent fractions with a denominator of 120
			$\frac{5}{8}\ \frac{13}{20}\ \frac{2}{3}\ \frac{7}{10}$			
	b	$\frac{9}{12} - \frac{5}{12}$		2	M1	Accept $\frac{18}{24} - \frac{10}{24}$ or $\frac{36}{48} - \frac{20}{48}$
			$\frac{4}{12}$		A1	Accept $\frac{8}{24}$ or $\frac{16}{48}$
						Total 4 marks

11	a	$\frac{180 - 48}{2}$		2	M1	
			66		A1	cao
	b	180 − "66" or 114 or $\angle ABC$ = "66°"		3	M1	
		360 − (69 + 106 + "114") or 360 − (106 + 69 + 48 + "66")			M1	
			71		A1	ft from "66"
						Total 5 marks

12 a	$80 \times \frac{2}{5}$, $2 \times \frac{80}{5}$		2	M1	Also award for 80 : 32 or 32 : 80
		32		A1	cao
b	3 + 1 or 4		2	M1	Also award for 60 : 20 or 20 : 60
		20		A1	cao
					Total 4 marks

13	$\frac{180 - 48}{2}$		3	M2	for 40×13.25 oe or $\frac{40}{60} \times 795$ oe M1 for $\frac{40}{60} \times (13 \times 60 + 15)$ or for 40 × time eg 40×13.15 or 526 seen or 40 × 795 or 40 × 13. …
		530		A1	cao
					Total 3 marks

14	correct enlargement vertices (10,10) (15,10) (15,20)		3	B3	B2 for translation of correct shape or 2 vertices correct or for enlargement 1½, centre (0, 0) B1 for one side correct length Allow ½ square tolerance for both vertices and lengths of sides of triangle
					Total 3 marks

15	a	$2\times(12\times7+7\times5+12\times5)$ or $2 \times (84 + 35 + 60)$			2	M1	for correct substn or 179 seen
				358		A1	for correct substn or 179 seen
	b	$12L+16 = 70$ or $8L + 4L = 54$ or $12L = 54$	$6L + 8 = 35$ or $4L + 2L = 27$ or $6L = 27$		3	M2	for correctly collecting Ls or constants or both
							M1 for correct substitution in given formula or in a correct rearrangement of the given formula in which L is not the subject
							eg $70=2(4L + 2\times4 + 2L)$ or $70=2(4L + 8 + 2L)$ or $35=4L+ 2\times4 + 2L$ or $35=4L+ 8 + 2L$ or $70 - 2\times2\times4 = 8L + 4L$ or $35 - 2\times4 = 4L + 2L$
				4.5 oe		A1	depends on M2
							Total 5 marks

16	a	$\frac{14}{100}\times850$		2	M1	
			119		A1	cao
	b	$\frac{266}{760}$ or 0.35		2	M1	
			35		A1	cao
	c	$\frac{204}{0.3}$ or $\frac{204}{30}$ or 6.8 or $\frac{204}{3}$ or 68		2	M1	
			680		A1	cao
						Total 6 marks

17	Examples of complete, correct explanations (i) 10×0.35 or 3.5 seen (may be in $\frac{3.5}{10}$) AND can't have half beads or there must be a whole number of (red) beads (ii) $3\frac{1}{2}$ red beads is impossible (iii) $\frac{7}{20}$ AND there are (only)10 beads or you need 20 beads (iv) The probability of any bead/a red bead must be tenths or must have 1 decimal place or must have 1 significant figure (v) Gives at least two examples that the probability of taking a red bead is $\frac{n}{10}$ where $2 \leq n \leq 9$ e.g. states 0.3 and 0.4		2	B2	for a complete, correct explanation B1 for a partially correct explanation Examples of partially correct explanations (i) $\frac{1}{10}$ or 0.1 seen (ii) Gives one example that the probability of taking a red bead is $\frac{n}{10}$ where $2 \leq n \leq 9$ (iii) There would be 3.5 red beads. (iv) $10 \times 0.35 = 3.5$ (v) $0.35 = \frac{7}{20}$ Treat statements like 'Don't know the number of red beads' as irrelevant.
					Total 2 marks

18	a		$p(p + 7)$	2	B2	Also accept $(p + 0)(p + 7)$ for B2 B1 for factors which, when expanded and simplified, give two terms, one of which is correct. SC B1 for $p(p + 7p)$
	b	$5x = 2$ or $-5x = -2$		3	M2	for $5x = 2$ or $-5x = -2$ or $\frac{5x}{5} = \frac{2}{5}$ M1 for $4 = 5x + 2$ or $5x = 4 - 2$ or $-5x = 2 - 4$ or $5x - 2 = 0$
			$\frac{2}{5}$ or 0.4		A1	dep on at least M1
	c		t^9	1	B1	cao
	d	$12y + 15 - 10y - 15$		2	M1	for 3 correct terms inc correct signs or for $12y + 15 - (10y + 15)$
			$2y$		A1	Accept $2y \pm 0$
						Total 8 marks

19	$10\times8 + 30\times24 + 50\times5 + 70\times2 + 90 \times 1$ or $80 + 720 + 250 + 140 + 90$ or 1280		4	M1	for finding at least three products $f\times x$ consistently within intervals (inc end points) and summing them
				M1	(dep) for use of halfway values
	$\frac{"1280"}{40}$			M1	(dep on 1st M1) for division by 40 or for division by their 8+24+5+2+1
		32		A1	cao
					Total 4 marks

20	½ × 10 × 12 or 60		3	M1	for area of one triangle	
	13 × 15 + 13 × 15 + 10 × 15 or 195 + 195 + 150 or 540			M1	for 13 × 15 + 13 × 15 + 10 × 15 oe	
		660		A1	cao	
					Total 3 marks	

21 a		1 3 9 27	2	B2	−B1 for eeoo or any repetition	
b	Yes and gives an explanation which either refers specifically to the members of *A* and their properties eg All the factors of 27 are odd. None of the factors of 27 are even. 2, 4, 6, 8 aren't factors of 27. or gives a general explanation which shows understanding of the statement eg *A* and *C* have no members in common. The intersection of *A* and *C* is empty.		1	B1	for 'Yes' and an acceptable explanation Do not accept an explanation which merely lists, without comment, the members of both sets. Do not accept an explanation which includes the symbol ∩ with no indication of its meaning.	
					Total 3 marks	

22	sin		3	M1	for sin	or M1 for cos and $\frac{\sqrt{"49.45"}}{7.9}$ following correct Pythagoras and A1 for 0.8901… or M1 for tan and $\frac{3.6}{\sqrt{"49.45"}}$ following correct Pythagoras and A1 for 0.5119…
	$\frac{3.6}{7.9}$ or 0.4556…			A1	for $\frac{3.6}{7.9}$ oe or 0.4556…	
					Total 3 marks	