

Mark Scheme Summer 2007

IGCSE

IGCSE Mathematics (4400)

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**4400 IGCSE Mathematics
Summer 2007
Paper 1F**

Q	Working	Answer	Mark	Notes
1.	(ai)	8 rectangles shaded	2	B1
	(ii)	60		B1 cao
	(b)	0.4(0)	1	B1
	(c)	$\frac{40}{100}$	2	M1 for $\frac{40}{100}$, $\frac{20}{50}$ etc
		$\frac{2}{5}$		A1 cao
				Total 5 marks
2.	(ai)	(1,5)	2	B1
	(ii)	(5,0)		B1
	(b)	64	1	B1 Allow ± 2 mm
	(c)	$8(0) + 2 \times "64"$	2	M1 Also award for 20.4-21.2
		204-212 inc		A1 ft from "64"
	(d)	isosceles	1	B1
	(ei)	77	2	B1 Allow ± 2
	(ii)	acute		B1
				Total 8 marks

Q	Working	Answer	Mark	Notes	
3.	(ai)		24	5	B1 cao
	(ii)		15		B1 cao
	(iii)		27		B1 cao
	(iv)		25		B1 cao
	(v)		23		B1 cao
	(bi)		24	2	B1 cao
	(ii)		39		B1 cao
					Total 7 marks

4.	(a)		31	1	B1 cao
	(b)		eg "Add 6"	1	B1
	(c)		61	1	B1 cao
	(d)		289	1	B1 ft from (b)
	(e)		eg "Sum of two odd numbers is always even"	1	B1 Accept if 'odd' used correctly
					Total 5 marks

5.	(ai)		B	4	B1 cao
	(ii)		F		B1 cao
	(iii)		I		B1 cao
	(iv)		D		B1 cao
	(b)		H	1	B1 cao
					Total 5 marks

Q	Working	Answer	Mark	Notes
6.	(a)		300	1 B1 cao
	(b)		855-875	1 B1
	(c)		Bengali	1 B1
	(d)		$100 < \bar{} < 150$	1 B1
	(e)	300 : 125		2 M1 for 300:125, 60:25 also for 125 : 300, 25 : 60, 5 : 12
			12 : 5	A1
	(f)	$\frac{70}{100} \times 330$		2 M1
			231	A1
	(g)	$\frac{143}{332} \times 100$		2 M1 for $\frac{143}{332}$ or 0.430722...
			43.1	A1 for 43.1 or better
				Total 10 marks
7.	(a)	$2x = 1 - 9$		2 M1
			-4 oe	A1
	(b)	$5y - 2y = 7 + 4$		2 M1
			$\frac{11}{3}, 3\frac{2}{3}$ oe	A1 Also accept 2 or more d.p. rounded or truncated e.g. 3.66, 3.67
				Total 4 marks

Q	Working	Answer	Mark	Notes
8.	(ai)	1 pm	2	B1 Accept 1300
	(ii)	10 pm		B1 Accept 2200
	(b)	-6	1	B1 cao
	(c)	Rio de Janeiro	1	B1 Accept "Rio"
	(di)	7	2	B1 Accept -7
	(ii)	5		B1 Accept -5
				Total 6 marks
9.	(a)	20	1	B1 cao
	(b)	$7 + 4 \times (5 - 2)$	1	B1 cao
	(c)	54.872	1	B1
	(d)	2.6	1	B1 cao
				Total 4 marks
10.	(i)	$y = 3$	3	B1
	(ii)	$x = 5$		B1
	(iii)	$y = x$		B1
				Total 3 marks
11.	(a)	$\frac{68.89}{9.1}$	2	M1 for 8.3, 68.89, 9.1 or 30.90...
		7.5703...		A1 Accept if first 5 figures correct
	(b)	7.57	1	B1 ft from (a) if non-trivial
				Total 3 marks

Q	Working	Answer	Mark	Notes
12.	(a)		$\frac{1}{5}$	1 B1 Accept 0.2, 20%
	(b)		$\frac{3}{5}$	2 M1 for fraction with denominator 5 A1 for $\frac{3}{5}$ Accept 0.6, 60%
	(c)	$150 \times \frac{3}{5}$		2 M1
			90	A1 ft from $\frac{3}{5}$ Do not accept $\frac{90}{150}$
				Total 5 marks

13.	(a)	28×15		2 M1
			420	A1 cao
	(b)	rectangle 5.6 cm long and 3 cm wide		2 B2 B1 for each Allow ± 2 mm
				Total 4 marks

14.	(a)	$(-3)^2 - 5 \times -3$		2 M1 for substn or 9 or 15 see
			24	A1 cao
	(b)		$x(x-5)$	2 B2 B1 for factors which, when expanded and simplified, give two terms, one of which is correct SC B1 for $x(5-x)$, $x(x-5x)$
				Total 4 marks

Q	Working	Answer	Mark	Notes	
15.	(a)		47	1	B1 cao
	(b)	51 - 46		2	M1 for 51 - 46, 46-51 etc
			5		A1 cao
	(c)	46×3+47×6+48×3+49×5+50×2+5 1×1 or 138+282+144+245+100+51 or 960		3	M1 for finding at least 4 products and adding
		"960" ÷ 20			M1 (dep) for division by 20
			48		A1 cao
					Total 6 marks

16.	(a)	translation 3 squares to the right and 1 square down		2	B2	B1 for translation Accept translate, translated etc Accept 'across' instead of 'to the right'	These marks are independent but award no marks if answer is not a single transformation
						B1 for 3 right and 1 down or $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$ but not (3, -1)	
	(b)	rotation of 90° clockwise about (2, -1)		3	B3	B1 for rotation Accept rotate, rotated etc	
						B1 for 90° clockwise or -90° or 270°	
						B1 for (2, -1)	
							Total 5 marks

Q	Working	Answer	Mark	Notes
17.	(ai)		2	B1 cao
	(ii)		2	B1 cao
	(b)	$9 + 4 - n = 8$ or $13 - n = 8$	2	M1 Also award for $2^n = 5$, $2^n = 32$ or 2^5 on answer line
			5	A1 cao
				Total 4 marks

18.	(a)	$12x - 15 - 8x - 4$	2	M1 for at least 3 terms correct
				A1
	(b)	$y^2 + 3y + 8y + 24$	2	M1 for 3 terms correct or $y^2 + 11y$ seen
				A1
	(c)		2	B2 cao B1 for either $5p^3$ or for $+4p$
				Total 6 marks

Q	Working	Answer	Mark	Notes
19.	(a) $\frac{38.5}{21} \times 60$ or $\frac{21}{60} = 0.35$; $\frac{38.5}{0.35}$		3	M1 for $\frac{38.5}{21}$ or 1.8333... or $\frac{38.5}{0.21}$ or 183.33... or $\frac{21}{60}$ or 0.35
				M1 for '1.8333...' $\times 60$ or $\frac{38.5}{0.35}$
		110	3	A1 cao
	(b) $\pi \times 4.19^2 \times 38500$			M2 M1 for $\pi \times$ (no with digits 419) ² \times no with digits 385
		2 120 000		A1 for 2 120 000 or for answer which rounds to 2 120 000 ($\pi \rightarrow 2123433.419$ 3.14 $\rightarrow 2122356.929$ 3.142 $\rightarrow 2123708.749$)
				Total 6 marks
				PAPER TOTAL 100 MARKS

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Paper 2F**

Q	Working	Answer	Mark	Notes
1.	(ai) (ii) (iii) (bi) (ii)	199, 999, 1009, 1999, 9000 9000 999 or 9000 4321 1243	1 1 1 1 2	B1 B1 B1 B1 B2 B1 for begin with 1 or end with 1 or 3
				Total 6 marks
2.		A at $0.5 \pm 2\text{mm}$ B at 1 C at $2 \leq d \leq 25\text{mm}$ from 0	1 1 1	B1 B1 B1 ie between 0 & 0.25 exclusive
				Total 3 marks
3.	(ai) (ii) (iii) (b)	Radius Chord Tangent Sector	3 1	B1 allow misspellings B1 allow misspellings B1 allow misspellings B1 allow misspellings
				Total 4 marks

Q	Working	Answer	Mark	Notes
4	(a) (b) (c) (d) (e) (fi) (ii)	21 3 3970 4000 63 15.83289... 15.8	1 1 1 1 1 1 1	B1 B1 or 3000 or 3 thousand or 1000 or thousands B1 B1 B1 B1 B1 ft
				Total 7 marks
5	(a) $4 \times 5 + 2$ (b) $28 / 4$	22 7	2 2	M1 A1 M1 Allow 30/4 or ans 7.25 oe A1
				Total 4 marks
6	(a) (b) (c) Attempt convert all to dec or % or c. d. All correctly converted	$\frac{12}{36}$ $\frac{3}{10}$ $\frac{9}{25}$	1 1 3	B1 B1 M1 M1 A1
				Total 5 marks

Q	Working	Answer	Mark	Notes
7	$2 \times 1.10 + 3 \times 1.25$ or 5.95 10.00 - "5.95"	4.05	3	M1 M1 dep A1
				Total 3 marks
8	(a) (b) Σx attempted or 56 / 8 (c) Arrange in order (di) (ii) (e)	7 5.5 oe Same Middle unchanged 2/8 oe	3 2 1 1 2	B1 M1 eg 48.125 M1 dep A1 M1 or answer 5 or 6 A1 B1 indep B1 or still 5.5 B1 num B1 denom Ratio subtr B1
				Total 3 marks
9	(a) (b)	6 cm ² Triangle correct ± 2 mm	3 2	B2 B1 for 5 to 7 incl B1 B2 B1 for a vertex correct ± 2 mm or correct size & orientation ± 2 mm
				Total 5 marks

Q	Working	Answer	Mark	Notes
10	(a) $(6 + 3) \times 5$ oe			
	(b) $70/5$ or 14 (-3)	45	2	M1 Bracket essential unless ans correct A1 M1 Allow $67/5$ or 13.2
	(c) $-85/5 - 3$ or $-17 - 3$	11	2	A1 M1
	(d)	-20 $5(x + 3)$ or $(x + 3) \times 5$ or $5x + 15$ oe	2	A1
			2	B2 B1 for answer $x + 3 \times 5$. B0 for answer $5x + 3$ or $x + 15$ 'x = ' subtract B1
				Total 8 marks
11	(a)	130	1	B1
	(bi)	40	1	B1
	(ii)	< sum of triangle	1	B1 Not $180 - (90 + 50)$
				Total 3 marks
12	(a) $^{2/5} \times 4800$	1920	2	
	(b) $0.85 \times "1920"$ oe	1632	2	Allow 0.85×4800 oe
				Total 4 marks
13	(i) 2	$x + 2x + 1 + 3x - 5 = 17$	1	B1 oe eg $6x - 4 = 17$ ISW not '= p'
	(ii) $6x = 21$ or $6x - 21 = 0$ etc	$x = 3.5$ oe eg $^{21}/_6$	2	M1 ft (i) if $6x = c$ A1
				Total 3 marks

Q	Working	Answer	Mark	Notes
14	9 seen $7/9 \times 27$ or $7 \times 27/9$ oe	21	3	B1 M1 dep B1 A1 21 seen, & ans = 3 B1M1A0 Total 3 marks
15	$5x - 20 = 35$ $5x = 55$	11	3	M1 M1dep or M2 for $x - 4 = 7$ A1 Total 3 marks
16	(a) $\frac{7 \times 50}{2}$ or 7, 50, 2 (b) 175 (c)	200 or 100 Num incr or 6.8 & 47.6 incr denom decr or 2.09 decr (b) rndd up (not rnd to 1 sf) or '175' rndd to 200	2 2 2	B1 for 7 and 2 B1 for 50 M1 $(6\text{or}7) \times (48\text{or}50)$ correctly eval'd 2 or 3 eg 168 A1f If no wking: ft (a) B2 any two of these B1 any one of these ignore other Total 6 marks
17	(a) $(2 + 3)/2 \times 6$ or $2 \times 6 + 1/2 \times 6 \times 1$ oe (b) $\frac{15}{20} \times 1000$ $\frac{1000}{20} \times 15$ $\frac{1000 \times 15}{20}$	15 750	2 3	M1 A1 M1 or 0.75 M1 ft '15' for M1M1 only A1 Total 5 marks

Q	Working	Answer	Mark	Notes
18	$x + 3 = 7x$ $(6x = 3 \text{ oe})$	$7y = 7x + 21$ $(6y = 21)$	3	M1 $y = 7(y-3)$ $y = 7y-21$ $0 = 6x - 3$ A1A1
		$x = 1/2, y = 3 1/2$		Total 3 marks
19	(a) tan used $\tan x = 5.1/4.2$ or $\tan x = 1.2\dots$ oe (b) $\sin 29 = AB/5$ or $c/\sin 29 = 5/\sin 90$ $AB = 5\sin 29$	$x = 50.5\dots$ $AB = 2.42\dots \text{ cm}$	3 3	M1 (sin or cos) & $(\sqrt{4.2^2+5.1^2})$ or 6.6 used M1 $\sin x = 5.1/\sqrt{4.2^2+5.1^2}$ or $\cos x = 4.2/\sqrt{4.2^2+5.1^2}$ A1 M1 $BC = 5\cos 29$ M1 $AB = \sqrt{5^2+(5\cos 29)^2}$ or $5\cos 29 \times \tan 29$ A1
				Total 6 marks
20	(a) $1 - (0.1 + 0.2 + 0.1)$ or $1 - 0.4$ oe (b) $0.2 + 0.1$ or $1 - ('0.6' + 0.1)$ (c)	0.6 0.3 (Poss) overlap or mut excl or doesn't wk for B or Y } No or poss or poss yes }	2 2 2	M1 or 0.6 in table A1 allow in table if not contrad on line M1 or 0.3 seen A1 B2 Can't tell & (No or poss) B1 Correct reason only: B1 Incorrect reason: B0 Unqualified Yes: B0
				Total 6 marks

Q	Working	Answer	Mark	Notes
21	$4^2 + 6^2$ (= 52) $\sqrt{4^2 + 6^2}$ or $\sqrt{52}$ or $2\sqrt{13}$	$h = 7.21\dots$	3	M1 M1dep A1
				Total 3 marks
				PAPER TOTAL 100 MARKS

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Paper 3H

Q	Working	Answer	Mark	Notes
1.	(a) $\frac{68.89}{9.1}$		2	M1 for 8.3, 68.89, 9.1 or 30.90...
		7.5703...		A1 Accept if first 5 figures correct Also accept $7\frac{519}{910}$, $\frac{6889}{910}$
	(b)	7.57	1	B1 ft from (a) if non-trivial ie (a) must have more than 2 d.p.
				Total 3 marks
2.	(a) $(-3)^2 - 5 \times -3$		2	M1 for substn or 9 or 15 seen
		24		A1 cao
	(b)	$x(x-5)$	2	B2 B1 for factors which, when expanded and simplified, give two terms, one of which is correct SC B1 for $x(5-x)$ and for $x(x-5x)$
				Total 4 marks
3.	$46 \times 3 + 47 \times 6 + 48 \times 3 + 49 \times 5 + 50 \times 2 + 51 \times 1$ or $138 + 282 + 144 + 245 + 100 + 51$ or 960		3	M1 for finding at least 4 products and adding
	"960" $\div 20$			M1 (dep) for division by 20
		48		A1 cao
				Total 3 marks

Q		Working	Answer	Mark	Notes
4.	(a)	translation 3 squares to the right and 1 square down		2	B2 B1 for translation Accept translate, translated etc
					B1 for 3 right and 1 down (accept 'across' instead of 'to the right') or $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$ but not (3, -1)
	(b)	rotation of 90° clockwise about (2, -1)		3	B3 B1 for rotation Accept rotate, rotated etc
					B1 for 90° clockwise or -90° or 270°
					B1 for (2, -1)
					Total 5 marks
5.	(ai)		7^8	2	B1 cao
	(ii)		5^6		B1 cao
	(b)	$9 + 4 - n = 8$ or $13 - n = 8$		2	M1 Also award for $2^n = 2^5$ or 2^5 on answer line
			5		A1 cao
					Total 4 marks

Q	Working	Answer	Mark	Notes
6.	(a)	$12x - 15 - 8x - 4$	2	M1 for at least 3 terms correct inc signs
				A1 cao
	(b)	$y^2 + 3y + 8y + 24$	2	M1 for 3 terms correct or $y^2 + 11y$ seen
				A1
	(c)		2	B2 cao B1 for either $5p^3$ or for $+4p$
				Total 6 marks

7.	(a)	$\frac{38.5}{21} \times 60$ or $\frac{21}{60} = 0.35$; $\frac{38.5}{0.35}$	3	M1 for $\frac{38.5}{21}$ or 1.83 or better or $\frac{38.5}{0.21}$ or 183.3 or better or $\frac{21}{60}$ or 0.35
				M1 for '1.8333...' $\times 60$ or $\frac{38.5}{0.35}$
			3	A1 cao
	(b)	$\pi \times 4.19^2 \times 38500$		M2 M1 for $\pi \times$ (no with digits 419) ² \times no with digits 385
				A1 for 2 120 000 or for answer which rounds to 2 120 000
				Total 6 marks

Q	Working	Answer	Mark	Notes
8.	(a) $\frac{270}{4500} \times 100$		2	M1 for $\frac{270}{4500}$ or 0.06 or $\frac{4770}{4500}$ or 1.06
		6		A1 cao
	(b) $117 \times \frac{100}{4.5}$		2	M1 for $\frac{117}{4.5}$ or 26 seen
		2600		A1 cao
	(c) $\frac{3328}{1.04}$ or $3328 \times \frac{100}{104}$		3	M2 for $\frac{3328}{1.04}$ or $3328 \times \frac{100}{104}$ M1 for $\frac{3328}{104}$, 104% = 3328 or 32 seen
		3200		A1 cao
				Total 7 marks

Q	Working	Answer	Mark	Notes
9.	(a) $5x - 2x = 7 + 4$		2	M1 for correct rearrangement
		$\frac{11}{3}, 3\frac{2}{3}$ oe		A1 Also accept 2 or more d.p. rounded or truncated e.g. 3.66, 3.67
	(b) $4 \times \frac{7-2y}{4}$ or $7 - 2y$ $= 4(2y + 3)$		4	M1 for clear intention to multiply both sides by 4 or a multiple of 4 For example, award for $4 \times \frac{7-2y}{4}$ or $7 - 2y$ $= 4 \times 2y + 3$ or $8y + 3$ or $2y + 3 \times 4$ or $2y + 12$
	$7 - 2y = 8y + 12$ or simpler			M1 for correct expansion of brackets (usually $8y + 12$) or for correct rearrangement of correct terms e.g. $8y + 2y = 7 - 12$
	$10y = -5$			A1 for reduction to correct equation of form $ay = b$
		$-\frac{1}{2}$ oe		A1
				Total 6 marks

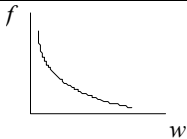
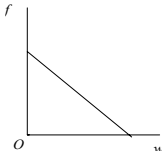
Q	Working	Answer	Mark	Notes
10.				Accept decimals in parts (a) and (b)
	(a) $150 \times \frac{3}{5}$		3	B1 for $\frac{3}{5}$ seen
				M1 for $150 \times \frac{3}{5}$
		90		A1 cao Do not accept $\frac{90}{150}$
	(bi) $\frac{4}{5} \times \frac{3}{4}$		5	M1 for $\frac{4}{5} \times \frac{3}{4}$ seen
		$\frac{12}{20}$ or $\frac{3}{5}$ oe		A1
	(ii) $\frac{2}{5} \times \frac{1}{4} + \frac{3}{5} \times \frac{2}{4}$			M1 for $\frac{2}{5} \times \frac{1}{4}$ or $\frac{3}{5} \times \frac{2}{4}$ or SC M1 for $\frac{2}{5} \times \frac{2}{5}$ or $\frac{3}{5} \times \frac{3}{5}$
				M1 (dep) for adding both above products or SC M1 (dep) for adding both above products
		$\frac{8}{20}$ or $\frac{2}{5}$ oe		A1 for $\frac{8}{20}$ or $\frac{2}{5}$ oe
				Total 8 marks

Q	Working	Answer	Mark	Notes
11.	(a)	tangent at any point of a circle and the radius at that point are perpendicular	1	B1 for mention of tangent and radius or line from centre
	(b)	$6.9^2 - 5.7^2$ or $47.61 - 32.49$ or 15.12	5	M1 for squaring and subtracting
		$\sqrt{6.9^2 - 5.7^2}$		M1 (dep) for square root
		3.88844...		A1 for 3.89 or better
		$2 \times 5.7 + 2 \times "3.88844..."$		M1 for $2 \times 5.7 + 2 \times "3.888..."$ only
			19.2	A1 for 19.2 or answer which rounds to 19.2 (19.176888...)
				Total 6 marks

12.	(a)		10, 26, 41, 50, 56, 60	1	B1 cao
	(b)	Points correct		2	B1 $\pm \frac{1}{2}$ sq ft from sensible table
		Curve or line segments			B1 ft if 4 or 5 points correct or if points are plotted consistently within each interval (inc end points) at the correct height
	(c)	Use of $w = 430$ on graph		2	M1 may be shown on graph or implied by 43, 44 or 45 stated
			Approx 16		A1 If M1 scored, ft from cumulative frequency graph If no method shown, ft only from correct curve
					Total 5 marks

Q	Working	Answer	Mark	Notes
13.		lines	4	B3 B1 for each correct line (full or broken) Ignore additional lines
		region		B1 for correct region shaded in or out or for correct region labelled R
				Total 4 marks

14.	(a)	$r^2 = \frac{A}{\pi}$		2	M1 for $r^2 = \frac{A}{\pi}$ or $r^2 = A \div \pi$
			$\sqrt{\frac{A}{\pi}}$		A1 ignore \pm
	(bi)	$\sqrt{\frac{13.5}{\pi}}$	2.07296...	4	M1 for 13.5 seen A1 for answer which rounds to 2.073
	(ii)	$\sqrt{\frac{14.5}{\pi}}$ or 2.14836...			M1 for $\sqrt{\frac{14.5}{\pi}}$ or value which rounds to 2.148 or 2.149 cao
			2.1		A1 dep on previous 3 marks in (b)
					Total 6 marks

Q	Working	Answer	Mark	Notes
15.	(ai) $f = \frac{k}{w}$		4	M1 May be implied by $1500 = \frac{k}{200}$
		$f = \frac{300000}{w}$		A1 Also award if answer is $f = \frac{k}{w}$ but k is evaluated as 300 000 in (a) or (b)
	(ii)			B2 B1 for graph with negative gradient (increasing or constant) even if it touches or crosses one or both axes e.g. 
	(b) $f = \frac{300000}{1250}$		2	M1 for substitution in $f = \frac{k}{w}$
			240	A1 ft from k
				Total 6 marks

Q	Working	Answer	Mark	Notes
16.	(ai)	3b	3	B1
	(ii)	3b - a		B1
	(iii)	$\frac{2}{3}\mathbf{a} + \mathbf{b}$ or $\mathbf{a} + \frac{1}{3}(3\mathbf{b} - \mathbf{a})$ or $3\mathbf{b} - \frac{2}{3}(3\mathbf{b} - \mathbf{a})$ oe		B1
	(b)		2	<p>B2 for $\frac{2}{3}\mathbf{a}$ or $\frac{2}{3}\vec{PQ}$ or $k = \frac{2}{3}$ unless clearly obtained by non-vector method</p> <p>or for expression in terms of \mathbf{a} and/or \mathbf{b} (need not be simplified) for \vec{EF} either correct or ft from (a)</p> <p>B1 for correct vector statement with at least 3 terms which includes \vec{EF} (or \vec{FE}) in terms of capital letters and/or \mathbf{a}, \mathbf{b}</p> <p>eg $\vec{PQ} = \vec{PE} + \vec{EF} + \vec{FQ}$</p> <p>$\vec{PF} = \vec{PE} + \vec{EF} \quad \mathbf{a} = \mathbf{b} + \vec{EF} + \vec{FQ}$</p> <p>If an attempt is crossed out and replaced, mark all attempts, including crossed out one, and award best mark.</p>
				Total 5 marks

Q	Working	Answer	Mark	Notes
17.	$\left(\frac{dy}{dx} =\right) 2x - \frac{16}{x^2}$		4	B1 for 2x B1 for $\pm \frac{16}{x^2}$ or $\pm 16x^{-2}$
	" $2x \pm \frac{16}{x^2} = 0$ "			M1
		(2, 12)		A1 cao For answer (2, 12) with no preceding marks scored, award B0 B0 M1 A1
				Total 4 marks

18.	(a)	$\pi \times 2.8^2 + \frac{1}{2} \times 4\pi \times 2.8^2$		3	M2 M1 for each term Also award for values rounding to 24.6 and to 49.2 or 49.3
			73.9		A1 for 73.9 or for answer which rounds to 73.9
	(b)	$\sqrt[3]{125}$ or 5 seen		3	M1
		$25 \times 73.89\dots$			M1 for $25 \times (a)$ or for $\pi \times (2.8 \times 5)^2 + 2\pi \times (2.8 \times 5)^2$ or for substituting $r = 2.8 \times 5$ in the expression used in (a)
			1850		A1 for 1850 or for any value in range 1846.3 - 1847.5 ft from $25 \times (a)$
					Total 6 marks

Q	Working	Answer	Mark	Notes
19.	$x^2 + (3x - 1)^2 = 5$		6	M1 for correct substitution
	$x^2 + 9x^2 - 3x - 3x + 1 = 5$ or $x^2 + 9x^2 - 6x + 1 = 5$			B1 (indep) for correct expansion of $(3x - 1)^2$ even if unsimplified
	$10x^2 - 6x - 4 = 0$			B1 for correct simplification
	$(5x + 2)(2x - 2) = 0$ or $(5x + 2)(x - 1) = 0$ or $(10x + 4)(x - 1) = 0$ or $\frac{6 \pm \sqrt{196}}{20}$ or $\frac{3 \pm \sqrt{49}}{10}$ or $\frac{3}{10} \pm \frac{\sqrt{49}}{10}$			B1 for correct factorisation or for correct substitution into the quadratic formula and correct evaluation of ' $b^2 - 4ac$ ' or for using square completion correctly as far as indicated
	$x = -\frac{2}{5}$ or $x = 1$			A1 for both values of x
		$x = -\frac{2}{5}, y = -2\frac{1}{5}$ $x = 1, y = 2$		A1 for complete, correct solutions
				Total 6 marks
				PAPER TOTAL 100 MARKS

**4400 IGCSE Mathematics
Summer 2007
Paper 4H**

Q	Working	Answer	Mark	Notes
1. (i) (ii)	$6x = 21$ or $6x - 21 = 0$ etc	$x + 2x + 1 + 3x - 5 = 17$ $x = 3.5$ oe eg $^{21}/_6$	1 2	B1 B1 oe eg $6x - 4 = 17$ ISW not ' $= p$ ' M1 ft (i) if $6x = c$ A1
				Total 3 marks
2.	9 seen $7/9 \times 27$ or $7 \times 27/9$ oe	21	3	B1 M1 dep B1 A1 21 seen, & ans = 3 B1M1A0
				Total 3 marks
3.	$5x - 20 = 35$ $5x = 55$	11	3	M1 M1 or M2 for $x - 4 = 7$ A1
				Total 3 marks

Q	Working	Answer	Mark	Notes
4.	(a) $\frac{7 \times 50}{2}$ or 7, 50, 2		2	B1 for 7 and 2 B1 for 50
	(b) 175			M1 $\frac{(6or7) \times (48or50)}{2 \text{ or } 3}$ correctly eval'd eg 168
	(c)	200 or 100	2	A1 A1f If no wking: ft (a)
		Num incr or 6.8 & 47.6 incr denom decr or 2.09 decr (b) rnded up (not rnd to 1 sf) or '175' rnded to 200	2	B2 any two of these B1 B2 any two of these B1 B1 any one of these Ignore other
				Total 6 marks
5.	(a) $(2 + 3)/2 \times 6$ or $2 \times 6 + \frac{1}{2} \times 6 \times 1$ oe		2	M1 A1
	(b) $\frac{15}{20} \times 1000$ $\frac{1000}{\times 15}$ $\frac{20}{}$ $\frac{1000 \times 15}{/ 20}$		3	M1 or 0.75 M1 ft '15' for M1M1 only
		750	3	A1
				Total 5 marks

Q	Working	Answer	Mark	Notes
6.	$x + 3 = 7x$ $(6x = 3 \text{ oe})$	$7y = 7x + 21$ $(6y = 21)$	$x = 1/2, y = 3 1/2$ 3	M1 $y = 7(y-3)$ $y = 7y-21$ $0 = 6x -3$ A1 A1
				Total 3 marks
7. (a)	tan used $\tan x = 5.1/4.2$ or $\tan x = 1.2\dots$ oe	$x = 50.5\dots$	3	M1 (sin or cos) & $(\sqrt{4.2^2+5.1^2})$ or (6.61) used M1 $\sin x = 5.1/\sqrt{4.2^2+5.1^2}$ or $\cos x = 4.2/\sqrt{4.2^2+5.1^2}$ A1
(b)	$\sin 29 = AB/5$ or $c/\sin 29 = 5/\sin 90$ $AB = 5\sin 29$	$AB = 2.42\dots$ cm	3	M1 $BC = 5\cos 29$ M1 $AB = \sqrt{(52+(5\cos 29)^2)}$ or $5\cos 29 \times \tan 29$ A1
				Total 6 marks
8. (a)	$1 - (0.1 + 0.2 + 0.1)$ or $1 - 0.4$ oe	0.6	2	M1 or 0.6 in table A1 allow in table if not contrad on line
(b)	$0.2 + 0.1$ or $1 - ('0.6' + 0.1)$	0.3	2	M1 or 0.3 seen A1
(c)		(Poss) overlap or mut excl or doesn't wk for B or Y } No or poss or poss yes }	2	Can't tell & (No or poss) B1 Correct reason only: B1 Incorrect reason: B0 Unqualified Yes: B0
				Total 6 marks

Q	Working	Answer	Mark	Notes
9.	$4^2 + 6^2$ (= 52) $\sqrt{4^2 + 6^2}$ or $\sqrt{52}$ or $2\sqrt{13}$	$h = 7.21\dots$	3	M1 M1 M1 dep A1
				Total 3 marks
10. (a)	V/H in any correct triangle attempted Grad = 2, may be embedded or implied	$y = '2'x + 1$	4	M1 eg $\frac{3-1}{1-0}$ not $\frac{3}{1}$ A1 M1 B2f B1f for grad. B1 for y-int (lin eqn) or B1f for just $'2'x + 1$ No wking, ans $2x + 1$: M1A1 B1
(b)		$y = -2x \pm c$	1	B1 $y = -2x \pm$ any no. (not 5) or letter or $y = -2x$
(c)		(0, -4)	1	B1
				Total 6 marks
11. (a)		56	1	B1
(b)	$x/20 = 6/12$ or $4/8$ oe	10 or 10.0....	2	M1 or $x/\sin 30 = 20/\sin(180-30-56)$ A1
(c)	$y/10 = 4/6$ or $8/12$ oe	6.6 to 6.7 incl oe	2	M1 or $y = \sqrt{4^2 + 8^2 - 2 \times 4 \times 8 \times \cos '56'}$ or $y/\sin 56 = 8/\sin(180-30-56)$ A1 (a)(b): ft (a) M-mks only
				Total 5 marks

Q	Working	Answer	Mark	Notes
12. (a)	a^7 / a^2 or $a \times a^4$ or $a^3 \times a^2$			M1
		a^5	2	A1
(b)		x^3	1	B1
(c)	Correctly cancel numbers or $(x + 1)$			M1
		$^{1/2}(x + 1)$ or $0.5(x + 1)$ or $\frac{x+1}{2}$ or $\frac{x}{2} + \frac{1}{2}$ or equiv	2	A1
				Not ISW
				Total 5 marks

13. (a)	Attempt arrange one set in order State or indicate correct 15 & 4 or 14 & 6	A: 11 B: 8	4	M1 M1 NB: IQR for B = 8, check wking
(b)		A more spread or gter dispersion or less consistent than B	1	A1 A1 B1 B1f Consistent with (a). Ignore other. Not: gter "range" or "difference" or "more constant" or "gter IQR" or "gter variance"
				Total 5 marks

Q	Working	Answer	Mark	Notes
14.	$5x - 7 = x^2 - 1$ or $5x - 7 = (x - 1)(x + 1)$ $x^2 - 5x + 6 = 0$ $(x - 2)(x - 3) (= 0)$ or $\frac{5 \pm \sqrt{(-5)^2 - 4 \times 6}}{2}$	$x = 2$ or 3	4	M1 condone $5x - 7 = x - 1 \times x + 1$ M1 allow different order with $= 0$ M1 $(x - 2.5)^2 + 6 - 6.25$ A1 T & I or no wking: 4 mks or 0 mks
				Total 4 marks
15.	2 overlapping circles, 12 in overlap 6 in H only 2 in T only	14	4	M1 M1 or 6 play H only M2 M1 or 20-6, 6+12+x=20, 20-18, 35-33: M3 A1 ans 2: M3A0
				Total 4 marks
16.	$9^2 + 5^2 - 2 \times 5 \times 9 \times \cos x = 6^2$ $90 \cos x = 70$ or $-90 \cos x = -70$ $(\cos x = \frac{70}{90})$	$x = 38.9$ or better	3	M1 or $\cos x = \frac{9^2 + 5^2 - 6^2}{2 \times 5 \times 9}$ M2 M1 A1
				Total 3 marks

Q	Working	Answer	Mark	Notes
17. (ai)		-2	1	B1 or $x \neq -2$ or $x = -2$
(ii)		$x < 1$	2	B2 B1 for $x \leq 1$ or 0, -1, -2, -3 . . .
(b)	$\sqrt{9}$ or $\sqrt{(10 - 1)}$ $\frac{1}{\text{her}\sqrt{9 + 2}}$			M1 or $\frac{1}{\sqrt{x-1}+2}$
(c)	$y = \sqrt{x - 1}$ -1, \sqrt $y^2 = x - 1$ Reverse order $x = y^2 + 1$ squ, +1	$1/5$ or 0.2	3	A1 ignore ans = -1 M1 M1 $y = \sqrt{x - 1}$ M1 M1dep $x = \sqrt{y - 1}$ condone $\sqrt{x-1}$ if next step correct
		$(g^{-1}(x) =) x^2 + 1$ oe	4	M1 M1 $x^2 = y - 1$ A1 $y^2 + 1$ M3 $y = x^2 + 1$ M3 $x = x^2 + 1$ M3 SC $(g^{-1}(x) =) (x + 1)^2$: B1
				Total 10 marks
18. (a)	$1/6 \times 1/6 \times 1/6$ alone	$1/216$ or 0.0046...	2	M1 0.17^3 or 0.16^3 or better. Not $\times k$ A1
(b)	1,1,4 or 1,2,6 or 2,1,6 seen or implied 1, 1, 4 <u>and</u> 1, 2, 6 (or 2, 1, 6) seen or implied $(1/6)^3 \times 3$	$1/72$ or $3/216$ or 0.014 or better	4	M1 ie one route M1 ie two routes incl 1, 1, 4 M1 ie three routes and correct exp'n A1 $(1/6)^3 \times 2$ or $1/108$, no wking: M0A0
				Total 6 marks

Q	Working	Answer	Mark	Notes
19. (a)	$\frac{1}{2} \times 5 \times 5 \times \sin 60$	10.8...	2	M1 $\frac{1}{2} \times 5 \times \sqrt{(5^2 - (\frac{5}{2})^2)}$ or $\frac{1}{2} \times 5 \times 4.33$ A1 $(25\sqrt{3})/4$ M1A0
(b)	sect = $\frac{1}{6} \times \pi \times 5^2$ or 13.1 "10.8" + $2(\frac{1}{6} \times \pi \times 5^2 - \text{"10.8"})$ or "10.8" + 2×2.26 or $2 \times \frac{1}{6} \times \pi \times 5^2 - \text{"10.8"}$	15.4 cm ²	3	M1 $\Delta + 2(\text{sect} - \Delta)$ M1 or $2 \times \text{sect} - \Delta$ Allow eg $\Delta = \frac{1}{2} \times 5 \times 5$ A1
				Total 5 marks
20 (i)		20	1	M1 B1
(ii)		30	2	A1 B2 or 1 sq reps freq of 5 seen anywhere: B1
				Total 3 marks
21. (a)		$(4x - 1)(4x + 1)$	1	B1
(bi)	$16 \times 10^2 - 1$ seen or implied $(4 \times 10 - 1)(4 \times 10 + 1)$ or 39×41	$3 \times 13 \times 41$	3	M1 13 or 39 or 41 or 123 as factor M1 factors 3, 13, 41 or 39, 41 or 13, 123 A1 Ans 3×533 M0A0
(ii)	1599×10^3 or 1599×1000	' $3 \times 13 \times 41$ ' $\times 2^3 \times 5^3$ oe	2	M1 or tree including 1000 or 10 and 100 A1f ft her (i) $\times 2^3 \times 5^3$
				Total 3 marks

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