

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

Q	Working	Answer	Mark	Notes
1. (i)	6x = 21 or 6x - 21 = 0 etc	$x + 2x + 1 + 3x - 5 = 17$	1	B1 B1 oe eg 6x - 4 = 17 ISW not '= p'
(ii)		$x = 3.5$ oe eg $^{21}/_6$	2	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
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 $\sqrt{(10 - 1)}$ $\frac{1}{\sqrt{9+2}}$			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 M1 M1 $x^2 = y - 1$
		$(g^{-1}(x) =) x^2 + 1$ oe	4	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			M1 0.17^3 or 0.16^3 or better. Not $\times k$
(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 $(1/6)^3 \times 3$	$1/216$ or 0.0046...	2	A1 M1 ie one route M1 ie two routes incl 1, 1, 4
		$1/72$ or $3/216$ or 0.014 or better	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