

Mark Scheme (Results) Summer 2007

IGCSE

IGCSE Mathematics (4400_4H)

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 '=' 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

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4.	(a) $\frac{7 \times 50}{2}$ or 7, 50, 2 (b) 175		2	B1 for 7 and 2 B1 for 50 M1 $\frac{(6or7) \times (48or50)}{2 \text{ or } 3}$ correctly eval'd eg 168
	(c)	200 or 100 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	A1 A1f If no wking: ft (a) 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		15	2	M1 A1
	(b) $\frac{15}{20} \times 1000$ $\frac{1000}{15} \times 20$ $\frac{1000 \times 15}{20}$		750	3	M1 or 0.75 M1 ft '15' for M1M1 only 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 $y = 7(y-3) \quad y = 7y-21 \quad 0 = 6x -3$ 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 $c/\sin 29 = 5/\sin 90$ $AB = 5 \sin 29$	$AB = 2.42\dots \text{ cm}$	3	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

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	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
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)	$a^7 \div a^2$ 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	eg $1/2$ or 0.5 or denom = 2 or $\frac{3(x+1)}{6}$ or $\frac{3x+3}{6}$ or $k(x+1)$ ($k \neq 1$)
		$1/2(x+1)$ 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			M1 M1	
		A: 11 B: 8	4	A1 A1	NB: IQR for B = 8, check wking
(b)		A more spread or gter dispersion or less consistent than B	1	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 $-90 \cos x = -70$ $(\cos x = 70/90)$	$x = 38.9$ 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)	$y = \sqrt{x - 1}$ $y^2 = x - 1$ $x = y^2 + 1$ - 1, \sqrt Reverse order squ, + 1	$\frac{1}{5}$ 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	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)	$\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6}$ alone	$\frac{1}{216}$ or 0.0046...	2	M1 0.17^3 or 0.16^3 or better. Not $\times k$ A1 M1 ie one route M1 ie two routes incl 1, 1, 4 M1 ie three routes and correct exp'n 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 $(\frac{1}{6})^3 \times 3$	$\frac{1}{72}$ or $\frac{3}{216}$ or 0.014 or better	4	$(\frac{1}{6})^3 \times 2$ or $\frac{1}{108}$, 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 A1
(ii)		30	2	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