

IGCSE November 2006 - Paper 4H Final Mark Scheme

Question No.	Working	Answer	Mark	Notes	
1	$\frac{6.46}{3.4}$	1.9	2	M1 A1	for 3.4 cao
					<b>Total 2 marks</b>

2 a		$6t + 15$	1	B1	cao
b		$y^3 - 3y^2$	2	B2	B1 for $y^3$ , B1 for $-3y^2$
c	$x^2 + 7x + 3x + 21$	$x^2 + 10x + 21$	2	M1 A1	Condone 1 error
d		$p^7 q^8$	2	B2	B1 for $p^7$ , B1 for $q^8$ . Allow $p^7 \times q^8$
					<b>Total 7 marks</b>

3	$\frac{45}{1+4}$	9	2	M1 A1	36 or 9:36 M1A0 cao
					<b>Total 2 marks</b>

4	a			B3	for $P = 2(n+1)$ oe	(a&b) Ignore units
					B2 for $2(n+1)$ oe or $n = \frac{P}{2} - 1$ oe	B2 for $P = 2n+1$ oe or $P = n+1 \times 2$ oe
		$P = 2(n+1)$	3		B1 for $P =$ any $f(n)$ (not $P = n$ )	B1 for $2n+1$ oe or $n+1 \times 2$ oe
	b	$P = 2n+2$		M1	$2n+2$ seen	or M2 for
		$2n = P - 2$	$\frac{P-2}{2}$ or $\frac{P}{2} - 1$	3	M1 A1	$\frac{P}{2} = n+1$ or $P - 2 \div 2$
					SC ft from $P = 2n+1$ or $2n+1$ only	M1 for $2n = P - 1$ or $P - 1 \div 2$
					A1 ft for $\frac{P-1}{2}$ oe	
						<b>Total 6 marks</b>

5	$\frac{5456}{7.75}$			M1	for $\frac{5456}{\text{time}}$	or 732 seen
				B1	for 7.75	or 465 if ...x 60 or "km/m"
		704	3	A1	cao	
						<b>Total 3 marks</b>

6	ai	eg “9 is not a member of $\mathcal{E}$ ”, “It is not an even number” “ $\mathcal{E}$ is only even nos”, “9 is odd”		1	B1	for either interpreting statement or for giving a reason
	ii		6, 12, 18	1	B1	Condone omission of brackets
	b		6, 12	2	B2	B1 for 6 or 3, 6, 12
						<b>Total 4 marks</b>

7		$\pi \times 4.7^2 \times 8.3$			M2	for $\pi \times 4.7^2 \times 8.3$
						M1 for $\pi \times 9.4^2 \times 8.3$ or 2303 - 2305
			576	3	A1	for 575.7-576.1
						<b>Total 3 marks</b>

8		$-7 = 4x - 1$			M1	for substituting correctly
			$-1\frac{1}{2}$ oe	2	A1	
						<b>Total 2 marks</b>

9	a	$48 \times \frac{3}{8}$			M1	
			18	2	A1	cao ans $\frac{18}{48}$ : M1A0
	b	eg $48 - 18 - 18$ , $x + 48 = 2(x + 18)$			M1	
			12	2	A1f	ft from “18”
						<b>Total 4 marks</b>

10	eg	$\begin{array}{r} 3 \overline{) 225} \\ \underline{3} \phantom{0} \\ 75 \\ \underline{5} \phantom{0} \\ 25 \\ \underline{5} \\ 5 \end{array}$			M2	for full systematic method of at least 3 divisions by prime numbers oe (factor trees) Condone 1 error
						Or for $3 \times 3 \times 5 \times 5$ or 3, 3, 5, 5
						M1 for 225 written as correct product with only one non-prime
			$3^2 \times 5^2$	3	A1	
						<b>Total 3 marks</b>

11	a	eg enlargement, (scale factor) 3, (centre) (1,2)			B3	B1 for enlargement Not single trans: BOB0B0
				3		B1 for 3, B1 for (1,2)
	b	Correct triangle		2	B2	B1 for 1 to the left B1 for 3 up
						<b>Total 5 marks</b>

12	$12x + 10y = 10$	$6x - 20y = 30$			M1	Correctly equating coefficients of x or y or rearranging to $x = \dots$ or $y = \dots$
	$(15x = 25)$	$(25y = -25)$				
		$x = 1\frac{2}{3}$ (or 1.7 or better), $y = -1$		3	A1 A1	Condone 1.66 cao
						<b>Total 3 marks</b>

13	a	$7.8 \times 10^7$	1	B1	cao
	b	0.004 oe	1	B1	cao
	c	$3.75 \times 10^{-12}$	1	B1	
					<b>Total 3 marks</b>

14	a	$\tan \angle LMN = \frac{9.3}{5.4}$		M1	$\sin LMN = \frac{9.3}{\sqrt{(9.3^2 + 5.4^2)}}$ or cos etc M1A1
		$9.3/5.4$ or 1.722...		A1	
		59.9	3	A1	for 59.85-59.9
	bi	5.45	1	B1	Accept 5.449, 5.4499...
	ii	5.35	1	B1	cao
	c	$\frac{9.35}{"5.35"}$		M1	
		1.74766...	2	A1	for 1.74 or 1.75 or better
					<b>Total 7 marks</b>

15		$\frac{180 \times (10 - 2)}{10}$ or $180 - \frac{360}{10}$		M1	
		144 36		A1	
		$180 - [360 - (60 + 144)]$ or 24 $60 - 36 (= 24)$		M1	$360 - 204 = 156$
		$\frac{360}{"24"}$		M1	$180 \times (n-2)/n = 156$ or $180 - 360/n = 156$ or $2340/15 = 156$
		15	5	A1	cao
					<b>Total 5 marks</b>

16	a		28, 50, 64, 74, 80	1	B1	cao
	b		Points		B1	In (b) incr'ing y's nec'y. Not blocks end pts $\pm \frac{1}{2}$ square ft from sensible table condone one error
			Curve or line segments	2	B1	dep end pts or midpts thro' pts $\pm \frac{1}{2}$ square; ignore $x < 5$ dep on 4 pts correct or ft
	c	cf for time of 17h found from graph			M1	In (c) incr'ing cf graph essential eg line, mark on graph
			~12	2	A1f	12 or consistent with curve
						<b>Total 5 marks</b>
17		$(\frac{67}{360} \text{ or } 0.186\dots) \times \dots$			M1	or $\dots \div (\frac{360}{67} \text{ or } 5.37\dots)$
		$\frac{67}{360} \times \pi \times 8.2^2$			M1	or $\pi \times 8.2^2 \div \frac{360}{67}$
			39.3	3	A1	for 39.2 - 39.32
						<b>Total 3 marks</b>
18	a		0.25, 2.5, 8, 15.25	2	B2	Accept rounding or truncating B1 for 2 or 3 correct
	b		Points		B1f	Allow $\pm \frac{1}{2}$ square ft if at least B1 in (a)
			Curve	2	B1f	ft if at least B1 in (a)
	c		1.4 – 1.47	1	B1	
	d	$x^2 - \frac{3}{x} = 2x$ or indication of $y = 2x$			M1	indication may be mark or line on graph Must see $2x$ or indic'n of line $y = 2x$
			~2.5	2	A1	ft if at least B1 in (b)
						<b>Total 7 marks</b>

19	$100x = 23.2323\dots$			M1	
		$\frac{23}{99}$	2	A1	
					<b>Total 2 marks</b>

20	ai	61	1	B1	cao
	ii	opp angles of a cyclic quad (add to $180^\circ$ or are suppl)	1	B1	
	b	90 – “61”	2	M1 A1f	$\angle ACB = 90^\circ$ stated or indicated on diagram
					<b>Total 4 marks</b>

21	a	128, 72	2	B2	B1 for 128 cao B1 for 72 cao
	b	bar correct	1	B1	34 little squares high
					<b>Total 3 marks</b>

22		$\sqrt{0.36}$ or 0.6		M1	
		$(1 - \text{“0.6”}) \times (1 - \text{“0.6”})$ or $0.4 \times 0.4$		M1	dep
		0.16	3	A1	for 0.16 oe
					<b>Total 3 marks</b>

23	$\frac{(2x+3)(x-4)}{(2x+3)(2x-3)}$			M1 M1	for $(2x+3)(x-4)$ for $(2x+3)(2x-3)$
		$\frac{x-4}{2x-3}$	3	A1	
					<b>Total 3 marks</b>

24	eg $\frac{8.6}{\sin 75^\circ} = \frac{"a"}{\sin 48^\circ}$ or $\frac{"b"}{\sin 57^\circ}$			M1	
	$\frac{8.6 \sin 48^\circ}{\sin 75^\circ}$ or 6.61(...) or $\frac{8.6 \sin 57^\circ}{\sin 75^\circ}$ or 7.46(...)			A1	
	$\frac{1}{2} \times 8.6 \times "6.616" \times \sin 57^\circ$ or $\frac{1}{2} \times 8.6 \times "7.467" \times \sin 48^\circ$			M1	dep M1 or $\frac{1}{2} \times "6.616" \times "7.467" \times \sin 75^\circ$
		23.9	4	A1	
					<b>Total 4 marks</b>

25	a	$(5-x)^2 + (6-x)^2 = (x+4)^2$ $25 - 10x + x^2 + 36 - 12x + x^2 = x^2 + 8x + 16$	4	B2 B1 B1	two of $(5-x), (6-x), (x+4)$ seen or equiv, eg $(10-x-4)$ B1 for one of these  correct equn not expanded correct equn expanded
	b	$\frac{30 \pm \sqrt{30^2 - 4 \times 45}}{2}$	3	M1	Allow $-30^2$
		$\frac{30 \pm \sqrt{720}}{2}$ or 28.4 & 1.584	1.58	A1 A1	
					<b>Total 4 marks</b>