4400 IGCSE Mathematics
November 2007
Paper 3H

Q		Working	Answer	Mark	Notes		
1.	(a)	360 / 5 (= 72) (180 – "72") / 2	 54	 **3**	M1 M1 A1	 dep	 or: 3 × 180 ÷ 5 ÷ 2
	(b)	360 / 5 or 180 – 2 x "54"	 72	 **2**	M1 A1f	or 72 seen	
							Total 5 marks

2.		1×5 + 2×8 + 3×3 + 4×4 (= 46) / 20	 2.3	 **3**	M1 M1 A1	 dep. Allow / his Σf or 2 if $^{46}/_{20}$ seen
						Total 3 marks

3.	(b)(i)		$2x + 2x + x = 12$	**1**	B1	oe ISW allow in (ii) if not contrad in (i) ignore units
	(ii)	$5x = 12$	 $x = 2.4$	 **2**	M1 A1	allow in (i) if not contrad in (ii) $4x = 12$ SC1 $x = 2.4$, no wking: B0M1A1
						Total 3 marks

4.	(b)	$\frac{160}{280}$ x 100 or 4/7 x 100	 57(.1…)	 **2**	M1 A1	
						Total 2 marks

5.	(a)	π x 2^2 12.6		**2**	M1 A1	 12.6 or better
	(b)	π x 3^2 – ("12.6" or π x 2^2) 15.7 to 15.8		**2**	M1 A1	π x 3^2 - ...
	(c)	2 x π x 3 18.8		**2**	M1 A1	allow $2\pi\times3$ – $2\pi\times2$ for M1 only 18.8 to 18.9 (incl)
						Total 6 marks

6.		sin 2.5/7.1 or 0.352…..	 20.6…..	 **3**	M1 A1 A1	not sin 90
						Total 3 marks

7.	(a)		1, 2, 3, 4, 6, 8	**2**	B2	no repetitions B1 with repeats or one digit omitted
	(b)		1, 2, 9	**2**	B2	B1 if one digit is omitted or 1, 2 , 9, 10
						Total 4 marks

8.		0.4 + 0.2 1 – (0.4 + 0.2)	 0.4	 **3**	M1 M1 A1	1 – (0.3 + 0.4 + 0.2) or 0.1 in table dep "0.1" + 0.3
						Total 3 marks

9.	(a)		$4v + 12$	**1**	B1	
	(b)		w^8	**2**	B2	w^{10} seen: B1
	(c)	$17 - x = 3\times7$ $17 = 21 + x$ or $-x = 4$	 $x = -4$	 **3**	M1 M1 A1	 or $17 = 3\times7 + x$
	(d)	$4y < 6 + 5$	 $y < 2.75$	 **2**	M1 A1	allow "=" only if ans incl "$y <$" or $y < {}^{11}/_{4}$ or $y < 2{}^{3}/_{4}$ on line
						Total 8 marks

10.	(a)		Africa	**1**	B1	or 8.4×10^8
	(b)		$1.11\text{x}10^{10}$ or $1.114\text{x}10^{10}$	 **2**	M1 A1	M1 for figs 111 or 1114
	(c)		1.66... or 1.7 or 1.67 or 1.66 or 5/3 or $1^2/_3$	 **2**	 B2	B1 for figs 166... or 17 or 167 or 166
						Total 5 marks

11.		$2x - y = 7$ or $3x = x + y + 7$ $2x = y + 7$	 $(y + 7)/2$	 **3**	M1 M1 A1	correctly collect x terms correctly add y to bs or $\frac{1}{2}(y + 7)$ or $y/2 + 3.5$ etc
						Total 3 marks

12.	(a)	$BC/8 = \cos25$ or $= 8\cos25$	 7.25(046..)	 **2**	M1 A1	
	(b)	7.5^2 - "7.25046..." ^{2} $\sqrt{(7.5^2 - \text{"7.25046..."}^2)}$	 1.92...	 **3**	M1 M1 A1f	 dep ft (a)
						Total 5 marks

13.	(a)		$(x + 10)(x - 10)$	**1**	B1	or $(x - 10)(x + 10)$ ignore "solutions"
	(b)	$(x \pm 4)(x \pm 3)$	$(x - 4)(x + 3)$	**2**	M1 A1	ignore "solutions"
	(c)	$(3x...)(x..)$ or $(...+ 1)(...+ 2)$	$(3x + 1)(x + 2)$	**2**	M1 A1	ignore "solutions"
						Total 5 marks

14.		$4x + 10y = 32$ or $x = (16-5y)/2$ or similar	$x = ½$, $y = 3$	**3**	M1 A1A1	Mult so coeffs of x or y are equal or make x or y subject Allow error in constant term
						Total 3 marks

15.		360 - 50 "310" / 360 or 0.861 "310" / 360 x π x 12^2	389 to 390	**4**	M1 M1 M1 A1	$^{50}/_{360}$ $\frac{50}{360}$ x π x 12^2 π x 12^2 - $\frac{50}{360}$ x π x 12^2
						Total 4 marks

16.	(a)	$x(x - 3)$, $2(x - 3)$	$^{x}/_{2}$	**3**	M1M1 A1	
	(b)	$2x - 3(x - 1)$ or $2x - 3x + 3$ oe $(x - 1)x$ or $x^2 - x$	$\frac{3-x}{x(x-1)}$ or $\frac{3-x}{x^2-x}$	**3**	M1 M1 A1	in denom
						Total 6 marks

17.	(a)		All correct	**2**	B2	ignore branches for 3rd shot correct structure & labels or probs: B1
	(b)(i)	$(¾)^2$	$^9/_{16}$ or 0.5625	**2**	M1 A1	 or 0.563
	(ii)	¾ x ¼ ¾ x ¼ + ¼ x ¾	$^3/_8$ or $^6/_{16}$ or 0.375	**3**	M1 M1 A1	
	(c)	$(¾)^3$ or $(¼)^3$ 1 – $((¾)^3 + (¼)^3)$	$^9/_{16}$ or 0.5625	**3**	M1 M1 A1	$(¾)^2$ x (¼) or $(¼)^2$ x ¾ 3 x $(¾)^2$ x (¼) + 3 x $(¼)^2$ x ¾ or 0.563 $(¾)^2$ x $(¼)^3$ or $(¼)^4$ x ¾ M1 10 × $(¾)^2$ x $(¼)^3$ + 5 × $(¼)^4$ x ¾ M1 $^{105}/_{1024}$ A1
						Total 10 marks

18.	(a)		68.5	**1**	B1	or 68.4$\dot{9}$ (with dot) or 68.499 (at least two 9's) or 68.49…..
	(b)	1150/"68.5" 16.8	 16	**3**	M1 A1 A1	
						Total 4 marks

19.	(a)	$P = kw^3$ $300 = k \times 12^3$	 $P = {}^{25}/_{144}\, w^3$	**3**	M1 M1 A1	 or $P = 0.174w^3$ oe
	(b)	"$^{25}/_{144}$" x 7.5^3	 73.2	**2**	M1 A1f	
	(c)	"$^{25}/_{144}$" x 10^3 (= 174) 2 x "$^{25}/_{144}$" x 10^3 = "$^{25}/_{144}$" x w^3 $\sqrt[3]{2000}$	 12.6	**4**	M1 M1 M1 A1	"$^{25}/_{144}$" can be k 2 × "174" = "0.174" x w^3 or 2000 = w^3 or 10 x $\sqrt[3]{2}$ M3
						Total 9 marks

20.	(a)	$1 + \sqrt{3} + \sqrt{3} + 3$	$4 + 2\sqrt{3}$	**2**	M1 A1	oe
	(b)	$2^2 + (1+\sqrt{3})^2 - 2x2x(1 + \sqrt{3})\cos 60$ $= 4 + \text{“}4 + 2\sqrt{3}\text{”} - 2(1 + \sqrt{3})$ $= 6$	 $\sqrt{6}$	 **4**	M1 M1 A1 A1	oe allow $2^2 + 2.73^2 - 2x2x2.73\cos 60$ oe oe ft (a), as long as in form $a + \sqrt{b}$ must have exp'd bracket & subst'd cos60 not ISW decimals can score only 1st M1
						Total 6 marks

21.	(a)	$2p(1 - p) = {}^{8}/_{25}$ $p(1 - p) = {}^{4}/_{25}$ or $p - p^2 = {}^{4}/_{25}$ $25p(1 - p) = 4$ or $25(p - p^2) = 4$		**3**	M1 M1 A1	allow $p(1 - p) = {}^{8}/_{25}$ for M1 only or $50p(1-p) = 8$ or $50(p - p^2) = 8$ or $25p - 25p^2 = 4$ oe, no fracs & 2 canc'ld Alt 1 $2p(1 - p) = {}^{8}/_{25}$ oe M1 $p = {}^{1}/_{5}$ or ${}^{4}/_{5}$ M1 $(p - {}^{1}/_{5})(p - {}^{4}/_{5}) = 0$ or $(5p - 1)(5p - 4) = 0$ A1 Alt 2 solve equn M1 $2\times{}^{1}/_{5}\times{}^{4}/_{5}$ M1 $= {}^{8}/_{25}$ A1 $p = {}^{1}/_{5}$ or ${}^{4}/_{5}$ seen without $2p(1 - p) = {}^{8}/_{25}$ or $2\times{}^{1}/_{5}\times{}^{4}/_{5}$: M0M0A0
						Total 3 marks