

Mark Scheme (Results) November 2007

IGCSE

IGCSE Mathematics (4400_3H)

4400 IGCSE Mathematics
November 2007
Paper 3H

Q		Working	Answer	Mark	Notes
1.	(a)	$360 / 5$ (= 72) $(180 - \text{"72"}) / 2$	54	3	M1 M1 A1 dep or: $3 \times 180 \div 5$ $\div 2$
	(b)	$360 / 5$ or $180 - 2 \times \text{"54"}$	72	2	M1 A1f or 72 seen
					Total 5 marks

2.		$1 \times 5 + 2 \times 8 + 3 \times 3 + 4 \times 4$ (= 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)	$\frac{160}{280} \times 100$ or $4/7 \times 100$	57(.1...)	2	M1 A1
					Total 2 marks

5.	(a)	$\pi \times 2^2$	12.6	2	M1 A1	12.6 or better
	(b)	$\pi \times 3^2$ - ("12.6" or $\pi \times 2^2$)	15.7 to 15.8	2	M1 A1	$\pi \times 3^2$ - ...
	(c)	$2 \times \pi \times 3$	18.8	2	M1 A1	allow $2\pi \times 3$ - $2\pi \times 2$ 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)	$17 - x = 3 \times 7$ $17 = 21 + x$ or $-x = 4$	$x = -4$	3	M1 M1 A1	or $17 = 3 \times 7 + x$
	(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)		1.11×10^{10} or 1.114×10^{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 $1/2(y + 7)$ or $y/2 + 3.5$ etc
						Total 3 marks

12.	(a)	$BC/8 = \cos 25$ or $= 8 \cos 25$	7.25(046..)	2	M1 A1	
	(b)	$7.5^2 - "7.25046..."^2$ $\sqrt{7.5^2 - "7.25046..."^2}$	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)	$(3x\dots)(x\dots)$ or $(\dots + 1)(\dots + 2)$	$(3x + 1)(x + 2)$	2	M1 A1	ignore "solutions"
						Total 5 marks

14.		$4x + 10y = 32$ or $x = (16-5y)/2$ or similar	$x = \frac{1}{2}, y = 3$	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.		$\frac{360 - 50}{360}$ or 0.861 $\frac{310}{360} \times \pi \times 12^2$	389 to 390	4	M1 M1 M1 A1	$\frac{50}{360}$ $\frac{50}{360} \times \pi \times 12^2$ $\pi \times 12^2 - \frac{50}{360} \times \pi \times 12^2$
						Total 4 marks

16.	(a)	$x(x - 3), 2(x - 3)$	$\frac{x}{2}$	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 3 rd shot correct structure & labels <u>or</u> probs: B1
	(b)(i)	$(\frac{3}{4})^2$	$\frac{9}{16}$ or 0.5625	2	M1 A1	or 0.563
	(ii)	$\frac{3}{4} \times \frac{1}{4}$ $\frac{3}{4} \times \frac{1}{4} + \frac{1}{4} \times \frac{3}{4}$	$\frac{3}{8}$ or $\frac{6}{16}$ or 0.375	3	M1 M1 A1	
	(c)	$(\frac{3}{4})^3$ or $(\frac{1}{4})^3$ $1 - ((\frac{3}{4})^3 + (\frac{1}{4})^3)$	$\frac{9}{16}$ or 0.5625	3	M1 M1 A1	$(\frac{3}{4})^2 \times (\frac{1}{4})$ or $(\frac{1}{4})^2 \times \frac{3}{4}$ $3 \times (\frac{3}{4})^2 \times (\frac{1}{4}) + 3 \times (\frac{1}{4})^2 \times \frac{3}{4}$ or 0.563 $(\frac{3}{4})^2 \times (\frac{1}{4})^3$ or $(\frac{1}{4})^4 \times \frac{3}{4}$ M1 $10 \times (\frac{3}{4})^2 \times (\frac{1}{4})^3 + 5 \times (\frac{1}{4})^4 \times \frac{3}{4}$ M1 $\frac{105}{1024}$ A1
						Total 10 marks

18.	(a)		68.5	1	B1	or 68.49 (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)	$P = kW^3$ $300 = k \times 12^3$	$P = \frac{25}{144} W^3$	3	M1 M1 A1	or $P = 0.174W^3$ oe
	(b)	" $\frac{25}{144}$ " $\times 7.5^3$	73.2	2	M1 A1f	
	(c)	" $\frac{25}{144}$ " $\times 10^3$ (= 174) $2 \times$ " $\frac{25}{144}$ " $\times 10^3 =$ " $\frac{25}{144}$ " $\times W^3$ $\sqrt[3]{2000}$	12.6	4	M1 M1 M1 A1	" $\frac{25}{144}$ " can be k $2 \times$ "174" = " 0.174 " $\times W^3$ or $2000 = W^3$ or $10 \times \sqrt[3]{2}$ M3
						Total 9 marks

20.	(a)	$1 + \sqrt{3} + \sqrt{3} + 3$	$4 + 2\sqrt{3}$	2	M1 A1	oe
	(b)	$2^2 + (1+\sqrt{3})^2 - 2 \times 2 \times (1 + \sqrt{3}) \cos 60$ $= 4 + "4 + 2\sqrt{3}" - 2(1 + \sqrt{3})$ $= 6$	$\sqrt{6}$	4	M1 M1 A1 A1	oe allow $2^2 + 2.73^2 - 2 \times 2 \times 2.73 \cos 60$ 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 1 st M1
Total 6 marks						

21.	(a)	$2p(1 - p) = \frac{8}{25}$ $p(1 - p) = \frac{4}{25}$ or $p - p^2 = \frac{4}{25}$ $25p(1 - p) = 4$ or $25(p - p^2) = 4$		3	M1 M1 A1	allow $p(1 - p) = \frac{8}{25}$ 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	Alt 2
					$2p(1 - p) = \frac{8}{25}$ oe M1 $p = \frac{1}{5}$ or $\frac{4}{5}$ M1 $(p - \frac{1}{5})(p - \frac{4}{5}) = 0$ or $(5p - 1)(5p - 4) = 0$ A1	solve equn M1 $2 \times \frac{1}{5} \times \frac{4}{5}$ M1 $= \frac{8}{25}$ A1
					$p = \frac{1}{5}$ or $\frac{4}{5}$ seen without $2p(1 - p) = \frac{8}{25}$ or $2 \times \frac{1}{5} \times \frac{4}{5}$: MOMOAO	
Total 3 marks						