IGCSE MATHEMATICS 4400, NOVEMBER 2005 MARK SCHEME

Paper 3H

Q		Working	Answer	Mark		Notes
1	(a)	2.6 – 2.5128...	0.087179...	**2**	B2	for 0.08717 or better (B1 for 2.5128... seen)
	(b)		0.087	**1**	B1	ft from (a) if <0.1
						Total 3 marks

2			one correct point plotted or stated second correct point plotted or stated correct straight line between -2 and 4	**3**	B1 B1 B1	 -B1 if no *y* scale
						Total 3 marks

3			kite with sides correct lengths correct arcs radius 7.6cm seen correct arcs radius 4.3cm seen correct kite	**4**	B1 M1 M1 A1	allow ±2mm allow ±2mm allow ±2mm within guidelines dep on both M marks
						Total 4 marks

4	(a)	(0x1) + (1x6) + (2x5) + (3x2) + (4x7) + (5x4) **OR** 6 + 10 + 6 +28 + 20 70/25	 2.8	**3**	M1 M1 A1	for no. bananas x frequency (dep on 1st M1) for sum and ÷25
	(b)	6/25 x 575	 138	**3**	B1 M1 A1	for 6/25 seen for 6/25 x 575
						Total 6 marks

5		∠ACD = 18° alternate angles 180 – 2 x "18" isosceles Δ and ∠ sum of Δ	 144	**5**	B1 B1 M1 B1 A1	stated or shown on diagram for both ft from "18"
						Total 5 marks

6		5.7 x –7.6 or -43.32 5.7 - 7.6 or -1.9	 22.8	**3**	M1 M1 A1	 cao
						Total 3 marks

7	(a)	3 x 125/20	 7.5	**2**	M1 A1	 cao
	(b)	50 x 5.7/3 or 5.7 = 3*d* / 50	 95	**2**	M1 A1	 cao
						Total 4 marks

8	(a)		$N = \frac{H(L+W)}{6}$ oe	**3**	B1 B2	for N = expression with L,W,H for $\frac{H(L+W)}{6}$ oe (B1 for $\frac{L+WH}{6}$, $L+\frac{WH}{6}$ etc)
	(b)	$P = 2L + 2W$	$(N =)\frac{PH}{12}$	**2**	M1 A1	for $\frac{PH}{12}$ oe; condone missing $N=$
						Total 5 marks

9	(a)		correct image	**2**	B2	B1: rotation 90° about any centre **or** rotation 90° clockwise about (4,2) **or** 2 vertices correct
	(b)		correct image	**2**	B2	B1: enlargement with scale factor ½ (or -½) from any centre or 2 vertices correct
						Total 4 marks

10	(a)	26/100 x 85 or 22.1 85 – "22.1"	 62.9	**3**	M1 M1 A1	 (dep) or M2 for 74/100 x 85
	(b)	48.1 / 0.74	 65	**3**	B1 M1 A1	for 0.74 seen for 48.1 / 0.74 cao
						Total 6 marks

11		$5x + 4 = 6$ $5x = 2$	 2/5	**3**	M1 M1 A1	
						Total 3 marks

12	(a)	(i) (ii)	42 – 44 10 – 12	**2**	B1 B1	
	(b)	UQ = 41 – 43 LQ = 10 – 12	 28 - 33	**2**	M1 A1	for reading at 25 and 75 stated or cfs of 25 and 75 indicated on graph
						Total 4 marks

13			lines region	**4**	B3 B1	B1 for each correct line for correct region shaded in or out
						Total 4 marks

14	(a)	$8^2 + 8^2 = 64 + 64 = 128$ $\sqrt{"128"}$ 11.3137... $\frac{11.3137...-8}{2}$ **OR** $4^2 + 4^2 = 16 + 16 = 32$ $\sqrt{"32"}$ 5.6568… 5.6568… - 4		**4**	M1 M1 A1 B1 *M1* *M1* *M1* *B1*	for $8^2 + 8^2$ (dep)

	(b)	$8^2 + 1.66^2 - 2 \times 8 \times 1.66\cos 45°$ or $8^2 + 9.66^2 - 2 \times 8 \times 9.66\cos 45°$ 47.974... **OR** $PX = AX = 1.66\cos 45° = 1.173...$ $(8 - "1.173...")^2 + "1.173"^2$ **OR** $OD = 4 + 1.66 = 5.66$ $5.66^2 + 4^2$	 6.93 6.93 6.93	**3**	M1 A1 A1 *M1* *M1* *A1* *M1* *M1* *A1*	 for 6.93 or better dep for 6.93 or better for 6.93 or better
						Total 7 marks

15	(a)		$-2 \leq x \leq 2$	**2**	B2	B1 $x \leq 2$ or $x \geq -2$ or $-2 < x < 2$ or $x \leq \pm 2$ or $x \leq \sqrt{4}$
	(b)		solid circles at 2 and –2 line joining circles	**2**	B1 B1	ft from (a) SC if $x \leq 2$ in (a) award B1 for solid circle at 2 and B1 for line to left
						Total 4 marks

16	(a)	(i) (ii)	42 angle at centre = 2 x angle at circumference	**2**	B1 B1	cao

	(b)	90 + "42" or 180 – 48	132	**2**	M1 A1	ft from "42"
						Total 4 marks

17	(a)		2	**1**	B1	cao
	(b)		-1 2	**2**	B1 B1	cao accept 1.9
	(c)	f (4)	-14	**2**	M1 A1	accept -13 to -14 inclusive
	(d)	tangent drawn at (-1,9) $\frac{\text{vertical difference}}{\text{horizontal difference}}$	≈ -9	**3**	M1 M1 A1	within guidelines of points on tang or chord near (-1,6) dep on second M1
	(e)		2 6	**2**	B1 B1	cao cao
						Total 10 marks

18		$\frac{4\pi}{3}\times 5^3 - \frac{4\pi}{3}\times 4.6^3$ 523.59... – 407.72...	116	**4**	M1 B1 B1 A1	for $\frac{4\pi}{3}R^3 - \frac{4\pi}{3}r^3$ $R = 5$ used correctly $r = 4.6$ used for 116 or better (115.878...) ft from r if $4 < r < 5$
						Total 4 marks

19	(a)	$\frac{3}{5}\times\frac{5}{6}$	$\frac{1}{2}$	**2**	M1 A1	
	(b)	$\frac{3}{5}+\frac{2}{5}\times\frac{7}{10}$ **or** $\frac{3}{5}\times\frac{5}{6}+\frac{2}{5}\times\frac{7}{10}+\frac{3}{5}\times\frac{1}{6}$ **or** $\frac{1}{2}+\frac{2}{5}\times\frac{7}{10}+\frac{3}{5}\times\frac{1}{6}$ **or** $1-\frac{2}{5}\times\frac{3}{10}$	$\frac{44}{50}$ **or** $\frac{22}{25}$	**3**	M1 M1 A1	for one correct product or term for complete correct expression SC if no marks in either part M1 for correct tree diagram
						Total 5 marks

20	(a)	(i) (ii) (iii)	5 7 9	**3**	B1 B1 B1	cao cao ft from 24 – (3 + *w* + *x*)
	(b)	(i) (ii) (iii)	3 15 0	**3**	B1 B1 B1	cao ft from *w* + *x* + 3 cao
						Total 6 marks

21		$3x^2 = 2x + 5$ $(3x - 5)(x + 1) = 0$ $x = \frac{5}{3}$ and $x = -1$ e.g. 2 x "$\frac{5}{3}$" + 5 2 x "-1" + 5 **OR** $y = 3\left(\frac{y-5}{2}\right)^2$ $(3y - 25)(y - 3) = 0$ $y = \frac{25}{3}$ and $y = 3$ e.g. $\frac{25}{3} = 2x + 5$ $3 = 2x + 5$	$x = \frac{5}{3}$, $y = \frac{25}{3}$ $x = -1$, $y = 3$ $x = \frac{5}{3}$, $y = \frac{25}{3}$ $x = -1$, $y = 3$	**6**	M1 M1 A1A1 M1 A1 *M1* *M1* *A1* *A1* *M1* *A1*	 for correct factorisation dep on both method marks for substituting both their x values into one of the original equations for both pairs; dep on first M1 for correct factorisation dep on both method marks for substituting both their x values into one of the original equations for both pairs; dep on first M1
						Total 6 marks **PAPER TOTAL 100 MARKS**