K.C.S.E 2002 MATHEMATICS PAPER 121/1 MARKING SCHEME

	SOLUTION			ALTERNATIVE METHO
1.	$+4 \times 4 - (20)$	$4 \times 4 + 20 = 36$		
	<del>-6 - (+6 + 3) + (6)</del>	-6 x 2 -6 -18	3 marks	and the said of
2.	Either $(x^2 + 4xy + 4y^2) - (x^2 -$	$4xy + 4y^2)$		
+	4xy + 4xy	97.		
	8xy		-  -	
	or $\{(x+2y)-(x-2y)\}$ $\{(x+2y)-(x-2y)\}$	-2y) + (x-2y)		
	(4y)(2x)		ľ	13
	8xy	¥1		
3,	Px - Py = xy		3 marks	
٠,	Px = xy + Py			
	Px = y(x+P)			
	y = Px			
	$\frac{x}{x+p}$		2	
	3 1		2 marks	
į. )	XY = OY - OX			
	= 3    2    1	* * * * * * * * * * * * * * * * * * * *		*
	$\begin{bmatrix} 3 \\ 2 \\ -2 \end{bmatrix} - \begin{bmatrix} 2 \\ 1 \\ -3 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$			xy = 1
				i
	=i+j+k'''		2 marks	· 1
	1 = 0.04072			
•	24.56			
	$4.346^2 = 18.89$			
	0.04072 + 18.89 = 18.9307	'1	3 marks	
	= 18.93	•	3 marks	
	H = 12 Sin 60		+-+	
	= 10.39			
	$AD = (12 \cos 60) \times 2 + 4$		M1	R.
	=16		WII	
	Area = $\{1/2 \times (4+16) \ 10.3$	9	Al	
	$= 103.9 \times 2$	•	1	
	$= 207.8 \text{ cm}^2$		4 marks	*
1	(a) Swiss francs		1	<del></del>
	52/1.28 = 40.63		B1	
	(b) Kshs	1500 me	}	
	'40.63' x 45.21		A1	
	= 1837	<del></del>	+	
	X>1		B	1
	$X \leq 4$ $\leftarrow 0 + + +$		B1	
	V 1 1 1	· · · · · · · · · · · · · · · · · · ·	B1	
PO	$(-0.09)^3 = 150700$	7	3 marks M1	
~ ()	P = 150 700		IVII	1
	0.91		MI	
	ali hublishers -	209		K.C.S.E Maths 1995-2005

1-	SOLUTIO!	. 4	MARKS	ALTERNATIVE METH
	No	Log	MI	
	150 700	5.1781	IVII	
	0.913	T9590 x 3	į	i
	0,713		I	1
1		T.8770	1	
	2.0 x 10 <sup>5</sup>	5.3011	LA1	1
-			4 marks	1
10.	(a) Making 3	equal length from B along BA		
	and ioinin	ig the last point Z to C	B1	
	and joining	ig the last point 2 to C	1	
	Cons	struction of angle at x equal to angle Z	B1	İ
	and identif	fyD		ŀ
	(b) Area of I	$DABD = \frac{1}{2} \times 2.7 \times 8$	MI	
1	=7.8	3cm²	Al	
1				
111	v. cention area -	22 (42 22)	4 marks	
111	x-section area =	22 (4° - 3°) cm		
- 1		7	1	
	Volume = 22	$2 \times 7 \times 0.2 \text{ cm}^3$	M1	
	7	•	1	
1	E	cm <sup>2</sup>	1	
-+		VIII	A1	
101	MV = 14 0 = 4	. 0. (		
121	MY = 14 - 8 = 6		M1	
	Therefore 4	$(MQ) = 8 \times 6$		
- 1	MQ:	= 12	Al	
			2 marks	
131	a) $x^2 = (\sqrt{5})^2 - 1^2$	= 4		<del></del>
1	x=2	<b>-</b>	Bi	
- 1				
1	Therefore Co	sx = 2	B1	
		¥55	B1	
		= 2/5		
- 1		= 5		
	b) Tan (90 -	v) = 3	2	
14 0	$rac{c}{r} = k + c$	1)-2	3 marks	
1411			M1	
-	q		1	
1	10 = k + c	k + 1.5c = 15	MI	
1	1.5			
1	20 = k + c	K + 1.25 = 25	Al	
	1.25	1.20 20	AI	
		2 = 40 E = 75	1	
		c = -40  K = 75		*
+	0.5		4 marks	
151(	$5 \times 220) + (3 \times 1)$	$20) + (4 \times 180) + (12 \times 150)$	M1	
	6 + 3 + 4 + 2		M1	
1	= 2700	= 180		
	15		MI	
67	D du = 6 - 2 -		4 marks	****
(	i) $dy = 6 \times 2 + x$	T-4	MI	
1	dx			4
1	When $x = 1$		3.1	
	dy = 6 + 1	= 3	1	
1	<del>dx</del>		1 3 2	
1	11) v + 1/ - 0/0	11		
1,	H) . T /2 - 2	-3-1/ <sub>2</sub> -210-	A1	
	11 12 72	· i - '/	i Am . stee	
1	, J.		1 124- 15	

	-SOLUTION	MARKS	ALTERNATIVE METHO
17.	(a) (i) 750,000 x 90 100	MI	
	= 675,000	1.,	
	(ii) 675,000 (1.1) <sup>3</sup> = 898,425	Al	
	898,425 + 75,000 = 973 425	MI A1	
	3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3	\ \A1	
	(b) $675,000 (1-1)^n = 816,750$ (1.1) <sup>n</sup> = 1.21	MI	
	n = 0.0828	A1	
	0.0414 $ n = 2  years$	8 marks	
18. (a)	$AC = \sqrt{(82 + 62)} = \sqrt{100} = 10$	BI	
	$EC = \sqrt{(102 + 202)} = \sqrt{5} \times 100 = 10\sqrt{5}$	MI. AI	
	(b) (i) Sin Q = $\frac{8}{7}$	Ml	
	(15)	Al	
	= 20.96°	MI	
	(ii) Tan $x = 8$	M1	
	20	1.	
	x = 21.8°	A1	
9.	(a)		
	HHH HHT HIH HIT		
	TIT TIH THI THH	B1 B1	
	1,11	BI	×
	(i) P (at least two heads) = 4 or 1	B1	
	8 2		*
	(ii) P (only one tail) = $\frac{3}{2}$	B1	
	8		
	3/		
1	b) c		
	1/6 C1	1 1	
	D	Bl	
	1/10		* 515 m
3	$V_{10}$ $W$ $C^1$	1,,	1
	$V_{10}$ $W$ $C^1$	M1	I
(i	9/10	Al	Ī
	$\begin{array}{ccc} (7 \times 5) & + (3 \times 1) \\ 10 & 6 & 10 & 10 \end{array}$		
	# 3 x9 = 27	Bi	
	$\frac{35}{60} + \frac{3}{100} = \frac{46}{75}$		
		8 marks	

	SOLUTION		МА	RKS ALTERN	ATIVE METH	HOD			
20.	a) Gradient = -1		В	· · · · · · · · · · · · · · · · · · ·			d		
20.	y = x + 7	3	В	1					
	(b) $7 - x = (x-1)^{n}$	+	4						
	x - x - 2	2 = 0	Į N	11					
	(x-2)(x	(+1)	= 0						
	x = 2, y =		A CONTRACTOR OF THE CONTRACTOR	41					
	x=1, y	= 8	**************************************	1	7	HARKS	ALTERNA	TIVE MI	THOD
	Co-ord	_	SOLUTION			Aldio	ADI DIG		
ļ	P (-1, §							51	
	1/ <sub>2</sub> (8+5) 3-2 (x	1	X.						
	$= \frac{39}{2} - \left\{ \frac{x^3 - x^2}{3} \right\}$		(b (i) IIrI = area of cu	ed surface					
			$r\Pi = 924 \times 7$			M1			
	= 19.5 - 82 + 1		22 x 28			A1	1		
	= 19.5 - 15		= 10.5  cm	,	· 1	8 marks			
	$= 4.5 \text{ or } 4^{1}/,$				⊕ 4°		100		
21	(a) Construction o		$h = \sqrt{(28^2 - 10.5)}$	52)					
21	Completion of		=25.96	5					
	(b) Libisector of F			, , , ,		-			
	Location of S.	24.	(b) $\text{Log } P = n \log r + \log r$	<b>K</b>				:	
1	(c) Consturction		P 1.2 1.5	2.0 2.5	3.5 4.5	1 .			
	SQ constru			0.30 0.40	0.54 0.65	BI	1:		3
	through R		Log P   0.08   0.18	0.30   0.40	0.54 0.05	1	1		
	$T_1 T_2 = 4.7 \pm$		R 1.58 2.25	3.39 4.74	7.86 11.5	B2		t te	
1			logr 0.20 0.35	0.53 0.68	0.90 1.06				
Ì_			log1 0.20 0.55	0.55   0.00					<b>, ,</b>
2	$\frac{2.(a)(i)\binom{a}{c}\binom{a}{d}\binom{2}{3}}{3}$		Scale S1						
			Plotting P1			1			
	2a + 3b = -4 5a + 3b = -1		Line L1						4
	a = 1, b=-2								
	Therefore M								
ł	fucicioic ivi							1. 1.	
	(ii) 1 -2 4 x		Log k = 0.05 = T.95	Bl	(w)			A 8	
	0 1 1 y		K = 0.8913 89 B1	4					
	C1 = (2, 1)		N = 2 = 0.6667	e .				1920 B	
	b)/0 17/1 -2		3					35 9 38	
	1 01/0 1		$0.6667 \pm 0.0200$						
-						8 mark			
12	23. (a) (i) 135 x $\Pi =$					omark	5		
	180								
	Area of sect								
						İ			
Ì	(ii) Length of				*				
	3 x 22 x 73								
	3 3 2 3			A service of the serv	1 to 1 to 1 to 1 to 1 to 1 to 1 to 1 to				A STATE OF THE STA
Ĭ	Vis		<b>1</b>						
	• 1.							•	
				*			-		
		į	<b>{</b>			1	1		