NAME _____ **INDEX NUMBER** _____

SCHOOL _____ **DATE** _____

LINEAR EQUATION

KCSE 1989 – 2012 Form 1 Mathematics *Answer all the questions*	Working space
1.	**1989 Q3 P1** Three artisans and two craftsmen earn sh. 220 in a day while four artisans and one craftsman earn sh. 185. Find the amount of money a craftsman earns in a day. (3 marks)	
2.	**1989 Q19 P1** A shopkeeper bought 50 *pangas* and 30 *jembes* from a wholesaler A for sh. 4260. Had he bought half as many *jembes* and *pangas* less, he would have paid sh. 1290 less. Had the shopkeeper bought from wholesaler B, he would have paid 10% more for a *panga* and 15% less for a *jembe*. How much would he have saved if he had bought the 50 *pangas* and the 30 *jembes* from wholesaler B. (8 marks)	
		Working space

3.	**1990 Q5 P1** The total weekly wages for 12 artisans and 4 apprentices are sh.5600. If the number of artisans is increased to 15 and that of the apprentices to 9, the weekly wages are sh.7800. Calculate the weekly wage for an artisan (3 marks)	
4.	**1991 Q3 P2** Two pairs of trousers and three shirts cost a total of 390. Five such pairs of trousers and two shirts cost a total of sh.810. Find the price of a pair of trousers and a shirt. (4 marks)	
5.	**1992 Q12 P1** Solve the equation $\dfrac{1}{4x} = \dfrac{5}{6x} - 7$ (3 marks)	

		Working space
6.	**1993 Q11 P2** Three times ago Juma was three times as old as Ali. In two years time the sum of their ages will be 62. Determine their present ages (3 marks)	
7.	**1994 Q 3 P1** A shopkeeper sells two types of pangas, type *x* and type *y*. Twelve type *x* pangas and five type *y* pangas cost sh 1260, while nine type *x* pangas and fifteen type *y* pangas cost sh 1620. Mugala bought eighteen type *y* pangas. How much did he pay for them? (4 marks)	
8.	**1996 Q3 P1** The cost of 5 skirts and 3 blouses is Kshs 1750. Mueni bought three of the skirts and one of the blouses for Kshs 850. Find the cost of each item (3 marks)	

9.	**1996 Q13 P1** A fruiterer bought 144 pineapples at Kshs 100 for every six pineapples. She sold some of them at Kshs. 72 for every three and the rest at Kshs 60 for every two. If she made a 65% profit, calculate the number of pineapples sold at Kshs 72 for every three (3 marks)	
10.	**1996 Q3 P2** Four farmers took their goats to the market. Mohammed had two more goats than Ali. Koech had as many goats as Mohammed , whereas Odupoy had 10 goats less than both Mohammed and Koech. (i) Write a simplified expression with one variable, representing the total number of goats. (1 mark) (ii) Three butchers bought all the goats and shared them equally. If each butcher got 17 goats, how many did Odupoy sell to the butchers (3 marks)	

		Working space
11.	**1997 Q15 P1** Akinyi bought three cups and four spoons for Kshs. 324. Wanjiku bought five cups and Fatuma bought two spoons of the same type as those bought by Akinyi. Wanjiku paid Kshs 228 more than Fatuma. Find the price of each cup and spoon.	
12.	**1997 Q2 P2** Mary has 21 coins whose total value is Kshs 72. There are twice as many five shillings coins as there are ten shillings coins. The rest are one shillings coin. Find the number of ten shillings coins that Mary has.	

		Working space
13.	**1998 Q3 P1** The mass of 6 similar books and 4 similar biology books is 7.2 kg. The mass of 2 such art books and 3 such biology books is 3.4 kg. Find the mass of one art book and mass of one biology book.	

14.	**2000 Q16 P1**
	Karani bought 4 pencils and 6 biro- pens for Ksh 66 and Tachora bought 2 pencils and 5 biro- pens for Ksh 51.
	  (a) Find the price of each item
	
	  (b) Musoma spent Ksh. 228 to buy the same type of pencils and biro pens. If the number of biro- pens he bought were 4 more than the number of pencils, find the number of pencils bought.	

15.	**2003 Q14 P1**
	
	  a) Write an expression in terms of x and y for the total value of a two digit number having x as the tens digit and y as the units digit.
	
	  b) The number in (a) above is such that three times the sum of its digits is less than the value of the number by 8. When the digits are reversed the value of the number increases by 9. Find the number.	

16.	**2006 Q14 P1** Hadija and Kagendo bought the same types of pens and exercise books from the same shop Hadija bought 2 pens and 3 exercise books for Kshs 78. Kagendo bought pens and 4 exercise books for Ksh 108 Calculate the cost of each item (3 marks)	

17.	**2007 Q11 P1** In fourteen years time, a mother will be twice as old as her son. Four years ago, the sum of their ages was 30 years. Find how old the mother was, when the son was born. (4 marks)	
18.	**2011 Q13 P1** In January, Mambo donated $1/6$ th of his salary to a children's home while Simba donated $1/5$ th of his salary to the same children's home. Their total donation for January was Ksh 14820.In February, Mambo donated $1/8$ th of his salary to the children's home while Simba donated $1/12$ th of his salary to the children's home. Their total donation for February was Ksh 8675. Calculate Mambos monthly salary. (4 marks)	

LINEAR EQUATION MARKING SCHEME

NO	SOLUTION	MARKS
1.	$3a + 2c = 220$ $2(4a + 1c = 185)$ $8a + 2c = 370$ — $\underline{3a + 2c = 220}$ — $5a = 150$ $a = 30$ $3(30) + 2c = 220$ $2c = 220 - 90$ $2c = 130$ $C = 65$ $= Sh.65$ **1989Q3**	3M
2.	$50p + 30j = 4260$ $45p + 15j = 2970$ $90p + 30j = 5940$ $50p + 30j = 4260$ $\quad 40p = 1680$ $\quad\quad P = 42$ $50(42) + 30j = 4260$ $30j = 4260 - 2100$ $\quad = 2160$ $j = \underline{2160} = 72$ $\quad\quad 3$ From B Cost of $p = \underline{110} \times 42 = 46.20$ $\quad\quad\quad 100$ Cost of $j = \underline{85} \times 72 = 61.20$ $\quad\quad\quad 100$ Total cost $46.20(50) + 61.20(30)$ $\quad\quad = 4156$ Save $= 4260 - 4156 = 104/=$ **1989Q19**	8M
3.	$9(12a + 4b = 2600)$ $4(15a + 9a = 7800)$ $108a + 36b = 50400$ — $60a + 36b = 31200$ $\underline{48a} = \underline{19200}$ $48 \quad\quad 48$ $a = 400$ $= sh\ 400$ **1990Q5**	3M

4.	$2(2t + 3s = 390)$ $3(5t + 2s = 810)$ $15t\ 3s = 2430$ — $4t + 6s = 780$ $\underline{11t} = \underline{1650}$ $11 \quad\quad 11$ $\quad t = 150$ $2(150) + 3s = 390$ $\quad \underline{3s} = \underline{90}$ $\quad 3 \quad 3 \quad\quad s = 30$ Trousers sh150 Shirt sh. 30 **1991Q5**	4M
5.	$\frac{1}{4}x = \frac{5}{6}x - 7$ $\frac{5}{6}x - \frac{1}{4}x = 7$ $\underline{20 - 6} = 7$ $\quad 24x$ $\underline{14} = 7$ $24x$ $24x = \frac{14}{7}$ $\underline{24x} = \underline{2}$ $24x \quad 24$ $= \frac{1}{12}$ **1992Q12**	3M
6.	$x + 3 + 2 = x + 5$ $3x + 3 + 2 = 3x + 3$ $x + 5 + 3x + 5 = 62$ $4x + 10 = 62$ $4x = 52$ $x = 13$ $13 + 3 = 16$ $3(13) + 3 = 42$ $\quad\quad$ Ali – 16yrs $\quad\quad$ Juma -42yrs **1993Q11**	3M
7.	$3(12x + 5y = 1260)$ $\quad 9x + 15y = 1620$ $\begin{pmatrix} 36x + 15y = 3780 \\ \underline{7x + 15y = 1620} \end{pmatrix}$ — $\quad 27x = 2160$ $\quad\quad x = 80$ $9(80) + 15y = 1620$ $\quad 15y = 1620 - 720$ $15y = 900$	4M

	y = 60 60 x 18 = Sh. 1080 **1994Q3**	
8	5s + 3b=1750................(i) 3s + b = 850.................(ii) 5s + 3b=1750................(iii) 9s + 3b =2250................(iv) 4s = 800 S = 200 B = 250 **1996Q3**	B1 M1 A1 3marks

9.	B.P = $\frac{144}{6}$ x 100 = 2400
	
	S.P = $\frac{165}{100}$ x $\frac{144}{6}$ x 100 = 3960
	
	Let pineapples sold at sh. 72 for every 3
	Be x and at sh 60 for every 2 be 144-x.
	
	$\frac{144-x}{2}$ x 60 + $\frac{x}{3}$ x 72 = 3960
	
	4320 – 30x + 24x = 3960
	    60x = 360
	     x= 60
	  1996Q13
		M1
		
		MI
		
		A1
		3marks

10.	Let Ali have a goats = a +a + 2 + 3(a +2)+a +2+3(a+2-10 =9a + 6 9a + 6 – 17 x 3 9a = 45 A =5 Odupoy sold 28-10=18goats **1996Q3**	B1 M1 A1 4marks

11.	Let the cost be sh c-cup
	    s- spoons
	3x + 4s = 324
	5c – 2s = 228
	15c + 20s = 1620
	
	15-6s = 684
	    26s = 936
	S = 36
	C = 60 **1997Q15**
		
		M1
		
		M1
		
		A1
		3
		Marks

12.	Let number of ten shillings coins be t Number of five shillings coins = 2t Number of one shilling coins = 21- 3t Value = 10t + 2t x 5 + (21-30x 1 = 72	B1 B1 M1

	= 17t = 51
	    t = 3
	  1997Q2
		A1

13.	6a + 4b = 72....(i)
	2a + 3b = 3.4....(ii)
	6a + 4b = 7.2
	6a + 9b = 10.2
	
	5b = -3
	b = $\frac{3}{5}$ .. 6a + $\frac{4 x 3}{5}$ =72
	
	    6a = 4.8
	     a = 0.8
	 one art book = 08kg
	 one biology book = 0.6kg
	  1998Q3
		
		M1
		
		M1
		
		A1
		3

14	a) 4p + 6b = 66
	    2p + 5b = 51
	    4p + 6b = 66
	    4p + 10b = 102
	     4b = 36
	      b = 9 p = 3
	b) let the number of pencils be x
	    3x + 9 (x + 4) 228
	    12x = 192
	    X = 16 **2000Q16**
		
		M1
		
		M1
		A1
		M1
		
		5
		marks

15.	a) 10x + y
	b) 3(x + y) + 8 = 10x + y
	    10y + x = 10x +y+9
	
	    2y – 7x = -8.......(i)
	    Y = x + 1........(ii)
	    2(x + 1)–7x = -8
	    x = 2, y = 3
	     The number xy is 23
	  2003Q14
		B1
		M1
		
		M1
		
		A1
		
		4
		marks

16.	2p+3b = 78 ......(i) 3p + 4b = 108.....(ii) 8p+ 12b = 312 9p+12b = 324 P = 12 b = 18 **2006Q14**	M1 M1 A1 4 marks
17.	x +y=40 y=40 –x s um of the squares in terms of x s =x² + (40-x) 2x²-80x+1600 Ds = 4x-80 = 0 Dx 4x = 8- x=20 Sum of the squares =202+(40-20)²	 M1 A1 M1 A1

	$20^2 + 20^2$ $400 + 400$ $= 800$ **2007Q11**	4 marks

18.	Let mambo's salary be x and samba's y
	$\frac{1}{6}x + \frac{1}{5}y = 14820$
	$\frac{1}{8}x + \frac{1}{12}y = 8675$
	$5x + 6y = 444600$
	$3x + 2y = 208,200$
	$5x + 6y = 444,600$
	$9x + 6y = 624,620$
	    $4x = 180000$
	    $4x = 180,000; x = 45,500$
	                2011Q13
		M1
		
		M1
		
		M1
		<u>A1</u>
		4