

NAME _____ INDEX NUMBER _____

SCHOOL _____ DATE _____

QUADRATIC EQUATIONS

<i>KCSE 1989 - 2012 Form 3 Mathematics</i>	Working Space
<p>1. 1989 Q 1 P2 The length of a rectangular mat is $1\frac{1}{2}$m longer than its width. Find the length of the mat if its area is $4\frac{1}{2}$m² (2 marks)</p>	
<p>2. 1990 Q5 P2 The sum of two numbers is 24. The difference of their squares is 144. What are the two numbers? (3 marks)</p>	

		Working Space
3.	<p>1990 Q3 P2 Find the coordinates of the points of intersection of the straight line $x-y = 5$ and the hyperbola $xy = 9$ (4 marks)</p>	
4.	<p>1991 Q1 P1 Solve for x $2x^2 + x - 36 = 0$ (4 marks)</p>	

		Working Space
5.	<p>1992 Q16 P2 Given that $x = -2$, find the values of y and z for the simultaneous equations</p> $x + y - z = -1$ $x - 2y + z = -7$ <p style="text-align: right;">(3 marks)</p>	
6.	<p>1993 Q6 P1 Solve the simultaneous equations</p> $x^2 + y^2 = 26$ $x - y = 4$ <p style="text-align: right;">(4 marks)</p>	
7.	<p>1994 Q16 P1 When the price of an item was increased by sh 5, I bought 2 items fewer with sh 200. What is the current price of the item?</p> <p style="text-align: right;">(3 marks)</p>	

		Working Space
8.	<p>1998 Q2 P2</p> <p>Simplify the expression $\frac{x-1}{x} - i$</p> <p>$\frac{2x+1}{3x}$</p> <p>Hence solve the equation $\frac{x-1}{x} - \frac{2x+1}{3x} = \frac{2}{3}$</p>	
9.	<p>1995 Q2 P2</p> <p>Solve the simultaneous equations (4 marks)</p> <p>$2x - y = 3$ $x^2 - xy = -4$</p>	

		Working Space
10	<p>2001 Q7 P1 The length of a room is 4 metres longer its width. Find the length of the room if its area is 32cm^2</p>	
11	<p>2004 Q20 P1 The simultaneous equations below, are satisfied when $x = 1$ and $y = p$</p> $-3x + 4y = 5$ $qx^2 - 5xy + y^2 = 0$ <p>a) Find the values of P and Q. b) Using the value of Q obtained in (a) above, find the other values of x and y which also satisfy the given simultaneous equations.</p>	

		Working Space
12	<p>2007 Q20 P1</p> <p>A retailer planned to buy some computers from a wholesaler for a total of Kshs 1,800,000. Before the retailer could buy the computers the price per unit was reduced by Kshs 4,000.</p> <p>This reduction in price enabled the retailer to buy five more computers using the same amount of money as originally planned.</p> <p>(a) Determine the number of computers the retailer bought (6 marks)</p> <p>(b) Two of the computers purchased got damaged while in store, the rest were sold and the retailer made a 15% profit Calculate the profit made by the retailer on each computer sold (4 marks)</p>	

		Working Space
13	<p>2008 Q23 P1</p> <p>A group of people planned to contribute equally towards a water project which needed Ksh 2,000,000 to complete. However, 40 members of the group withdrew from the project. As a result, each of the remaining members were to contribute Ksh 2500 more.</p> <p>a) Find the original number of members in the group. (5marks)</p> <p>b) Forty five percent of the value of the project was funded by Constituency Development Fund (CDF). Calculate the amount of contribution that would be made by each of the remaining members of the group. (3 marks)</p> <p>c) Member's contributions were in terms of labour provided and money contributed. If the ratio of the value of labour to the money contributed was 6:19; calculate the total amount of money contributed by the members. (2 marks)</p>	

		Working Space
14	<p>2009 Q19 P2</p> <p>A school planned to buy x calculators for a total cost of ksh 16,200. The supplier agreed to offer a discount of ksh 60 per calculator. The school was then able to get three calculators for the same amount of money.</p> <p>(a) Write an expression in terms of x for the</p> <p>(i) original price of each calculator (1 mark)</p> <p>(ii) price of each calculator after the discount. (1 mark)</p> <p>(b) Form an equation in x and hence determine the number of calculators the school bought (5 marks)</p> <p>(c) calculate the discount offered to the school as a percentage (3 marks)</p>	

		Working Space
15	<p>2009 Q2 P2</p> <p>Find a quadratic equation whose roots are $1.5 + \sqrt{2}$ and $1.5 - \sqrt{2}$, expressing it in the form $ax^2 + bx + c = 0$, where a, b, and c are integers (3 marks)</p>	
16	<p>2010 Q21 P1</p> <p>Motorbike A travels at 10 km/h faster than motorbike B whose speed is x km/h.</p> <p>Motorbike A takes $1\frac{1}{2}$ hours less than the motorbike B to cover a 180 km journey.</p> <p>(a) Write an expression in terms of x for the time taken to cover the 180 km journey by:</p> <ul style="list-style-type: none"> i. Motorbike A; (1 mark) ii. Motorbike B; (1 mark) <p>(b) Use the expressions (a) above to determine the speed, in km/h, of motorbike A. (6marks)</p> <p>(c) For a journey of 48 km, motorbike B starts 10 minutes ahead of motorbike A.</p> <p>Calculate in minutes, the difference in the time of their arrival at the destination. (2marks)</p>	

		Working Space
17	<p>2010 Q5 P2</p> <p>The length of flower garden is 2 m less than twice its width. The area of the garden is 60m^2. Calculate its length. (3 marks)</p>	
18	<p>2010 Q21 P2</p> <p>A hall can accommodate 600 chairs arranged in rows. Each row has the same number of chairs. The chairs are rearranged such that the number of row is increased by 5 but the number of chairs per row is decreased by 6.</p> <p>a) Find the original number of rows of chairs in the hall. (6 marks)</p> <p>b) After the re-arrangement 450 people were seated in the hall leaving the same number of empty chairs in each row. Calculate the number of empty chairs per row. (4 marks)</p>	

		Working Space
19	<p>2011 Q20 P2 A parent has two children whose age difference is 5 years. Twice the sum of the ages of two children is equal to the age of the parent .</p> <p>(a) Taking x to be the age of the elder child, write an expression for: (i) the age of the younger child (ii) the age of the parent.</p> <p>(b) In twenty years time, the product of the children's age will be 15 times the age of their parents (i) Form an equation in x and hence determine the present possible ages of the elder child. (4marks) (ii) Find the present possible ages of the parent (2marks) (iii) Determine the possible ages of the younger child in 20 years time (2marks)</p>	

		Working Space
20	<p>2012 Q9 P2</p> <p>Solve the equations</p> $x + y = 17$ $xy - 5x = 32$ <p>(4 marks)</p>	
21	<p>2012 Q20 P1</p> <p>Express $\frac{1}{x-2} - \frac{2}{x+5} = \frac{3}{x+1}$ in the form $ax^2 + bx + c = 0$ where a, b and c are constants hence solve for x.</p>	

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(4 marks)