QUADRATIC EXPRESSIONS & EQUATIONS

KCSE QUICK REVISION

Compilation of Possible Questions in Mathematics Likely to be examined in KCSE.

A Special Analysis of Prediction Questions that may be Tested in KCSE from this Topic in Form 3.

MATHEMATICS

SERIES 1

For Marking Schemes

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QUADRATIC EXPRESSIONS AND EQUATIONS

1. The table shows the height metres of an object thrown vertically upwards varies with the time t seconds

The relationship between s and t is represented by the equations $s = at^2 + bt + 10$ where b are constants.

t	0	1	2	3	4	5	6	7	8	9	10
s		45.1									

(a) (i) Using the information in the table, determine the values of a and b **(2 mks)**

(ii) Complete the table **(1 mark)**

(b)(i) Draw a graph to represent the relationship between s and t **(3 marks)**

(ii) Using the graph determine the velocity of the object when t = 5 seconds

2. **(a)** Construct a table of value for the function $y = x^2 - x - 6$ for $-3 \leq x \leq 4$

(b) On the graph paper draw the graph of the function

$Y = x^2 - x - 6$ for $-3 \leq x \leq 4$

(c) By drawing a suitable line on the same grid estimate the roots of the equation

$x^2 + 2x - 2 = 0$

3.(a) Draw the graph of $y = 6 + x - x^2$, taking integral value of x in $-4 \leq x \leq 5$. (The grid is provided. Using the same axes draw the graph of $y = 2 - 2x$

(b) From your graphs, find the values of X which satisfy the simultaneous equations $y = 6 + x - x^2$ $y = 2 - 2x$

(c) Write down and simplify a quadratic equation which is satisfied by the values of x where the two graphs intersect.

4. **(a)** Complete the following table for the equation $y = x^3 - 5x^2 + 2x + 9$

x	-2	-1.5	-1	0	1	2	3	4	5
x^2		-3.4	-1	0	1		27	64	125
$-5x^2$	-20	-11.3	-5	0	-1	-20	-45		
2x	-4	-3		0	2	4	6	8	10
9	9	9	9	9	9	9	9	9	99
		-8.7			9	7		-3	

(b) On the grid provided draw the graph of $y = x^3 – 5x^2 + 2x + 9$ for $-2 \leq x \leq 5$

(c) Using the graph estimate the root of the equation $x^3 – 5x^2 + 2 + 9 = 0$ between x = 2 and x = 3

(d) Using the same axes draw the graph of $y = 4 – 4x$ and estimate a solution to the equation $x^2 – 5x^2 + 6x + 5 = 0$

5. **(a)** Complete the table below, for function $y = 2x^2 + 4x - 3$

x	-4	-3	-2	-1	0	1	2
$2x^2$	32		8	2	0	2	
4x - 3			-11		-3		5
y			-3			3	13

(b) On the grid provided, draw the graph of the function $y=2x^2 + 4x - 3$ for $-4 \leq x \leq 2$ and use the graph to estimate the rots of the equation $2x^2+4x – 3 = 0$ to 1 decimal place. **(2mks)**

(c) In order to solve graphically the equation $2x^2 + x - 5 = 0$, a straight line must be drawn to intersect the curve $y = 2x^2 + 4x – 3$. Determine the equation of this straight line, draw the straight line hence obtain the roots.

$2x^2 + x – 5$ to 1 decimal place.

6.(a) **(i)** Complete the table below for the function $y = x^3 + x^2 – 2x$ **(2mks)**

x	-3	-2.5	-2	-1.5	-1	-0.5	0	0.5	1	2	2.5
x^3		15.63				-0.13			1		
x^2			4					0.25			6.25
-2x						1			-2		
y				1.87				0.63			16.88

(ii) On the grid provided, draw the graph of $y = x^3 + x^2 – 2x$ for the values of x in the interval $– 3 \leq x \leq 2.5$

(iii) State the range of negative values of x for which y is also negative

(b) Find the coordinates of two points on the curve other than (0, 0) at which x-coordinate and y- coordinate are equal

7.The table shows some corresponding values of x and y for the curve represented by Y = ¼ x3 -2

X	-3	-2	-1	0	1	2	3
Y	-8.8	-4	-2.3	-2	-1.8	0	4.8

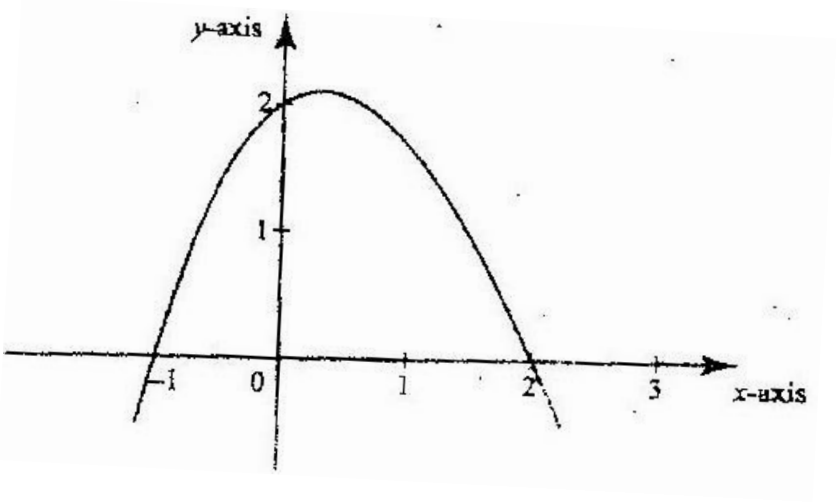
On the grid provided below, draw the graph of $y = ¼ x^2 - 2$ for $-3 \leq x \leq 3$. Use the graph to estimate the value of x when y = 2

8.A retailer planned to buy some computers form 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. This reduction in price enabled the retailer to buy five more computers using the same amount of money as originally planned.

(a) Determine the number of computers the retailer bought

(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

9.The figure below is a sketch of the graph of the quadratic function y = k (x+1) (x-2)



Find the value of k

10. (a) Draw the graph of $y= x^2 – 2x + 1$ for values $-2 \leq x \leq 4$

(b) Use the graph to solve the equations $x^2 – 4= 0$ abd line $y = 2x +5$

11. **(a)** Draw the graph of $y = x^3 + x^2 – 2x$ for $-3 \leq x \leq 3$ take scale of 2cm to represent 5 units as the horizontal axis

(b) Use the graph to solve $x^3 + x^2 – 6 -4 = 0$ by drawing a suitable linear graph on the same axes.

12. Solve graphically the simultaneous equations $3x – 2y = 5$ and $5x + y = 17$

For Marking Schemes/Answers

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