MATRICES

1. **1989 Q14 P1**

   Given that A = $\begin{pmatrix} 2 & 4 \\ 3 & 6 \end{pmatrix}$ and B = $\begin{pmatrix} 11 & 3 \\ 4 & 1 \end{pmatrix}$ find C such that B.C = A

   (4 marks)

2. **1991 Q13 P1**

   Find the inverse of the matrix $\begin{pmatrix} 2 & 5 \\ 3 & 4 \end{pmatrix}$. Hence or otherwise solve the equations

   $2x + 5y = 9$
   $3x + 4y = 6$

3. **1993 Q8 P1**

   Given that A = $\begin{pmatrix} -2 & 3 \\ 4 & -1 \end{pmatrix}$ and B $\begin{pmatrix} -20 & 30 \\ 40 & -1 \end{pmatrix}$

   i)   Find $A^{-1}B$

   ii)   Hence or otherwise write down the inverse of B   (4 marks)

4. **1994 Q13 P1**

   Determine the values of x for which the matrix below has no inverse. $\begin{pmatrix} 2x & x^2 \\ 2 & 1 \end{pmatrix}$ (3 marks)

5. **1995 Q 12 P1**

   A clothes dealer sold 3 shirts and 2 trousers for Kshs. 840 and 4 shirts and 5 trousers for Kshs 1680. Form a matrix equation to represent the above information. Hence find the cost of 1 shirt and the cost of 1 trouser.   (4 marks)

6. **1996 Q 11 P1**

   A and B are two matrices. If A = $\begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$ find B given that

   $A^2 = A + B$ (4 marks)

7.	**1997 Q 9 P1**
	Given that A = $\begin{pmatrix} 1 & 3 \\ 5 & 3 \end{pmatrix}$ B = $\begin{pmatrix} 3 & 1 \\ 5 & -1 \end{pmatrix}$ C = $\begin{pmatrix} p & 0 \\ 0 & q \end{pmatrix}$ and AB = BC, determine the value of P
8.	**1998 Q 7 P1**
	A matrix A is given by A = $\begin{pmatrix} x & 0 \\ 5 & y \end{pmatrix}$
	a) Determine A^2
	b) If A^2 = $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, determine the possible pairs of values of x and y
9.	**2000 Q 23 P1**
	Matrix p is given by $\begin{pmatrix} 4 & 7 \\ 5 & 8 \end{pmatrix}$
	(a) Find P^{-1}
	(b) Two institutions, Elimu and Somo, purchase beans at Kshs. B per bag and maize at Kshs m per bag. Elimu purchased 8 bags of beans and 14 bags of maize for Kshs 47,600. Somo purchased 10 bags of beans and 16 of maize for Kshs. 57,400
	(i) Form a matrix equation to represent the information above (1mark)
	(ii) Use the matrix P^{-1} to find the prices of one bag of each item
	(c) The price of beans later went up by 5% and that of maize remained constant. Elimu bought the same quantity of beans but spent the same total amount of money as before on the two items. State the new ratio of beans to maize.
10	**2001 Q 13 P1**
	Given that P = $\begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$ and Q = $\begin{pmatrix} 2 & -3 \\ -1 & 2 \end{pmatrix}$, find the matrix product PQ
	Hence, solve simultaneous equations below:
	$\quad$ 2x – 3 y = 5
	$\quad$ -x + 2y = -3
11	**2002 Q 4 P2**
	Determine the inverse, T^{-1} of the matrix T = $\begin{pmatrix} 1 & 2 \\ 1 & -1 \end{pmatrix}$
	Hence find the coordinates to the point at which the two lines x + 2y = 7 and x – y = 1 intersect (4marks)

12	**2003 Q 17 P2**
	Given the simultaneous equations
	      $5x + y = 19$
	      $-x + 3y = 9$
	  a) Write the equations in matrix form. Hence solve the simultaneous equations. (5mks)
	
	b) Find the distance of the point of intersection for the line $5x + y = 19$ and $-x + 3y = 9$ from the point (11,-2) (3mks)

13	**2004 Q 7 P2**
	
	Use matrices to solve the simultaneous equations
	      $4x + 3y = 18$
	      $5x - 2y = 11$

14	**2004 Q 20 P2** (a) Given that the matrix A = $\begin{pmatrix} 2 & 3 \\ 3 & 4 \end{pmatrix}$ Find A^{-1} the inverse of A (b) Kimtai bought 200 bags of sugar and 300 bags of rice for a total of Kshs. 850,000. Buya bought 90 bags of sugar and 120 bags of rice for a total of Kshs. 360,000. If the price of a bag of sugar is Kshs x and that of rice is Kshs. Y, (i) Form two equations to represent the information above (ii) Use the matrix A^{-1} to find the prices of one bag of each item. (c) Kali bought 225 bags of sugar and 360 bags of rice. He was given a total discount of Kshs. 33, 300. If the discount on the price of a bag of rice was 2%, calculate the percentage discount on the price of a bag of sugar.
15	**2007 Q 23 P1** (a) Find the inverse of the matrix $\begin{pmatrix} 9 & 8 \\ 7 & 6 \end{pmatrix}$ (2 marks) (b)In a certain week a businessman bought 36 bicycles and 32 radios for total of Kshs 227 280. In the following week, he bought 28 bicycles and 24 radios for a total of Kshs 174 960.Using matrix method, find the price of each bicycle and each radio that he bought (4 marks) (c)In the third week, the price of each bicycle was reduced by 10% while the price of each radio was raised by 10%. The businessman bought as many bicycles and as many radios as he had bought in the first two weeks. Find by matrix method, the total cost of the bicycles and radios that the businessman bought in the third week. (4 marks)
16	**2008 Q 12 P1** Two matrices A and B are such that A= $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ and B = $\begin{pmatrix} 2 \\ 4 \end{pmatrix}$

	Given that the determinant of AB = 4, find the value of k.
17	**2010 Q 19 P1** a).Find A $^{-1}$,the inverse of matrix A = $\begin{pmatrix} 5 & 6 \\ 7 & 9 \end{pmatrix}$ (2 mks) b) Okello bought 5 physics books and 6 mathematics books for a total of Ksh 2,440.Ali bought 7 physics books and 9 mathematics books for a total of ksh 3,560. (i) Form a matrix equation to represent the above information. (1 mk) (ii) Use matrix method to find the price of a physics book and that of a mathematics book. (3mks) c) A school bought 36 physics books and 50 mathematics books. A discount of 5% was allowed on each physics book whereas a discount of 8% was allowed on each mathematic book.Calculate the percentage discount in the cost of all the books bought. (4mks)
18	**2011 Q 19 P1** a) The product of the matrices $\begin{pmatrix} 1 \\ p \end{pmatrix}$ and $\begin{pmatrix} 1.5 & -0.5 \\ , & p-2 \end{pmatrix}$ is a singular matrix. Find the value of *p*. (3 mks) b) A saleswoman earned a fixed salary of Ksh.*x* and a commission of Ksh *y* for each item sold. In a certain month she sold 30 items and earned a total of Ksh 50 000. The following month she sold 40 items and earned a total of Ksh. 56 000. i) Form two equations in *x* and *y*. (2 mks) ii) Solve the equations in (i) above using matrix method. (3 mks) iii) In the third month she earned Ksh 68 000. Find the number of items sold. (2 mks)