1. Matrices

1. 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 $B \times C = A$ (3mks)

2. Use matrix method to solve the   (3mks)

   $3y + 2x = 13$

   $2y - 3x = 0$

3. A matrix $P = \begin{pmatrix} 2 & -1 \\ -4 & 3 \end{pmatrix}$, $Q = \begin{pmatrix} a \\ b \end{pmatrix}$ and $R = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$. Find the values of a and b given that PQ = R.

   Using matrix method.   (3mks)

4. A matrix A is given as $A = \begin{pmatrix} x & 0 \\ 5 & y \end{pmatrix}$

   (i)   Determine A^2 (1mk)

5. Two matrices A and B are such that

   $A = \begin{pmatrix} k & 4 \\ 3 & 2 \end{pmatrix}$ $B = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

   Given that the determinant of AB = 4, find the value of K. (3 mks)

6. Given that A is $\begin{pmatrix} 3 & 2 \\ 4 & -1 \end{pmatrix}$ and A $\begin{pmatrix} \frac{1}{11} & \frac{2}{11} \\ \frac{4}{11} & \frac{-3}{11} \end{pmatrix}$

   Find the value of a and b in the expression: (3 mks)

   $\begin{pmatrix} 3 & 2 \\ 4 & -1 \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 12 \\ 5 \end{pmatrix}$

7. Solve for the unknowns given that the following is a singular matrix.

   $\begin{pmatrix} 1 & 2 \\ x & x\text{-}3 \end{pmatrix}$

8. Given that $A = \begin{pmatrix} 1 & 5 \\ 3 & 7 \end{pmatrix}$ and $B = \begin{pmatrix} 7 & 3 \\ -4 & -2 \end{pmatrix}$ and that C = AB, find C^{-1}

9. B is a matrix $\begin{pmatrix} 3 & 2 \\ 2 & 2 \end{pmatrix}$ and C is the matrix $\begin{pmatrix} 9 & -3 \\ 2 & 1 \end{pmatrix}$

   . If A is a 2 x 2 matrix and A x B = C. determine the matrix A.

10. An object of area 20 cm^2 undergoes a transformation given by the matrix

   $\begin{pmatrix} -1 & -2 \\ 4 & 3 \end{pmatrix}$ followed by $\begin{pmatrix} 2 & 3 \\ -1 & 2 \end{pmatrix}$ find the area of the final image.

11. Find the matrix B such that AB = I and $A = \begin{pmatrix} 3 & 2 \\ -1 & 3 \end{pmatrix}$. Hence find the point of intersection of the

   lines $3x + 2y = 10$ and $3y - 4 = x$.

   $\begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$ $\begin{pmatrix} 2 & -3 \\ -1 & 2 \end{pmatrix}$

12. Given that **P** =   and **Q** =   find ;the matrix product PQ. Hence solve the simultaneous equations below:-

$$2x - 3y = 5$$
$$-x + 2y = -3$$

13. Solve for x and y in the following matrix equation using elimination method

$$\begin{pmatrix} \frac{1}{2} & -\frac{1}{4} \\ \frac{2}{5} & \frac{1}{6} \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ 6 \end{pmatrix}$$

14. A triangle XYZ , X (-1, -1) , Y (-2, -4) Z (-6 , -9) is reflected in the line X axis followed by a reflection in line X= Y. Find the image of the final image

15. Triangle ABC is the image of triangle PQR under a transformation **M** = $\begin{pmatrix} 2 & 4 \\ 0 & 2 \end{pmatrix}$ where P, Q, R map onto A, B, C respectively.
Given the points P (5, -1) Q (6, -1) and R(4, - 0.5) draw the triangle ABC on the grid

    provided.

b) Triangle ABC in (a) above is to be enlarged by scale factor 2 with centre at (11, - 6) to map

    onto A^1B^1 and C^1. Construct and label triangle A^1B^1 and C^1 on the same grid.

c) By construction, find the coordinates of the centre and the angle of rotation which can be used

    to rotate triangle $A^1B^1C^1$ onto triangle $A^{II}B^{II}C^{II}$ whose coordinates are (-3, -2) , (-3, -6) and

    (-1, -2) respectively.

16. Triangle ABC with an area of 15 cm^2 is mapped onto triangle $A^IB^IC^I$ using matrix
M = $\begin{pmatrix} 2 & -3 \\ 1 & 1 \end{pmatrix}$. Find the area of triangle $A^IB^IC^I$.

17. **T** is a transformation represented by the matrix $\begin{pmatrix} 5x & 2 \\ -3 & x \end{pmatrix}$ under **T** a square whose area is 10cm^2 is mapped onto a square of area 110cm^2. Find the possible values of **X**

18. Triangle $A^1B^1C^1$ is the image of $\triangle$ ABC under a transformation represented by the matrix
M = $\begin{pmatrix} 3 & 2 \\ 9 & 5 \end{pmatrix}$
If the area of triangle $A^1B^1C^1$ is 54cm^2. Determine the area of triangle ABC

19. Find the matrix B such that $AB = I$ and A = $\begin{pmatrix} 3 & 2 \\ -1 & 3 \end{pmatrix}$. Hence find the point of intersection of the

lines **3x + 2y = 10** and **3y – 4 = x.**