2. *Matrices*

1	$C = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ Let $\begin{pmatrix} 11 & 3 \\ 4 & 1 \end{pmatrix}\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} 2 & 4 \\ 3 & 6 \end{pmatrix}$ $(11a + 3c = 2)\times 1 \qquad (11b + 3d = 4)\times 1$ $(4a + c = 3)\times 3 \qquad (4b + d = 6)\times 3$ $11a + 3c = 2 \qquad 11b + 3d = 4$ $12a + 3c = 9 \qquad 12b + 3d = 18$ $a = 7 \qquad b = 14$ $c = -25 \qquad d = -50$ $\therefore C = \begin{pmatrix} 7 & 14 \\ -25 & -50 \end{pmatrix}$	M_1 M_1 A_1 3	Alternative $C = B^{-1}A$ ✔equations B^{-1} $\begin{pmatrix} -1 & 3 \\ 4 & -11 \end{pmatrix}$ allow any two ✔solving of equations $\begin{pmatrix} -1 & 3 \\ 4 & -11 \end{pmatrix}\ \begin{pmatrix} 2 & 4 \\ 3 & 6 \end{pmatrix}$ or equivalent
2.	$\begin{pmatrix} 2 & 3 \\ -3 & 2 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 13 \\ 0 \end{pmatrix}$ $Det\ 4 - {}^{-}\ 9 = 13$ $\frac{1}{13}\begin{pmatrix} 2 & -3 \\ 3 & 2 \end{pmatrix}\begin{pmatrix} 2 & 3 \\ -3 & 2 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{13}\begin{pmatrix} 2 & -3 \\ 3 & 2 \end{pmatrix}\begin{pmatrix} 13 \\ 0 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ $x = 2,\ y = 3$	M1 M1 A1	
		03	

1.

$$\begin{pmatrix} & \end{pmatrix}\begin{pmatrix} \ \end{pmatrix} = \begin{pmatrix} \ \end{pmatrix}$$

$$\begin{pmatrix} & \end{pmatrix}\begin{pmatrix} & \end{pmatrix}\begin{pmatrix} \ \end{pmatrix} = \begin{pmatrix} & \end{pmatrix}\begin{pmatrix} \ \end{pmatrix}$$

Premultiplication by the inverse.

Simplification.

C.A.O

$$\begin{pmatrix} & \end{pmatrix}\begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} & \\ & \end{pmatrix}$$

$$\begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} & \\ & \end{pmatrix}$$

$a = 2$ ✓ *and* $b = 3$ ✓

2. $(x-3) - (2x) = 0$
$x-3-2x = 0$
$-2x + x - 3 = 0$
$-x - 3 = 0$
$x = 3$

3. $\begin{pmatrix} & \\ & \end{pmatrix} \begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} & \\ & \end{pmatrix}$

Determinant $= +65 - 49 = 16$

$C^{-1} = 1 \quad -5 \quad 7$

$$\begin{pmatrix} & \\ & \end{pmatrix}$$

4. $3 \quad 2 \quad \begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} & \\ & \end{pmatrix}$
$2 \quad 2$

$$\begin{pmatrix} & \\ & \end{pmatrix} = 9$$
$$= 2$$

$a = 7$
$c = -6$
$3b + 2d = -3$
$2b + 2d = 1$
$b = -4$
$d = 4.5$
$A = \begin{pmatrix} & \\ & \end{pmatrix}$

5. $20x\ (-3 - {}^{-}8)$
100 *area of* 1^{st} *image.*
$100 \times (4 - {}^{-}3)$
700 *area of* 2^{nd} *image*

6. *Det.* $9 + 2 = 11$

$$A^{1} = \frac{1}{11} \begin{pmatrix} & \\ & \end{pmatrix}$$

$$\begin{pmatrix} & \\ & \end{pmatrix}\begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} & \\ & \end{pmatrix}$$

3 -1 y 4

$$\begin{pmatrix} \\ \end{pmatrix} = \frac{1}{11}\begin{pmatrix} \\ \end{pmatrix}\begin{pmatrix} \\ \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix} = \frac{1}{11}\begin{pmatrix} \\ \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}$$

P (2, 2)

7 $PQ = \begin{pmatrix} \\ \end{pmatrix}$

$$\begin{pmatrix} \\ \end{pmatrix}\begin{pmatrix} \\ \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix}\begin{pmatrix} \\ \end{pmatrix}\begin{pmatrix} \\ \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}\begin{pmatrix} \\ \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}$$

x =1 y= -2

8. *½ x – ¼ y = 2*

$^{2}/_{5} + {}^{1}/_{6} = 6$

2x _ y = 8

12x + 5y = 180

10x – 5y = 40 +

22x = 220

x = 10

¼ y = ½ (10) $^{-2}$

¼ y = 5-2 = 3

Y = 12

9. $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$

$$\begin{pmatrix} \\ \end{pmatrix}9$$

$$\begin{pmatrix} \\ \end{pmatrix}\begin{pmatrix} X^1 & Y^1 & Z^1 \\ -1 & -2 & -6 \\ 1 & 4 & 9 \end{pmatrix}$$

=

$$\begin{pmatrix} \\ \end{pmatrix}$$

=

1	4	9
-1	-2	-6

Final image $X^{11}\ Y^{11}Z^{11}$

$X^{11}(1, -1)\ Y^{11}(4, -2),\ Z^{11}(9, -6)$

10. $P\ \ Q\ \ R \qquad A\ \ B\ \ C$

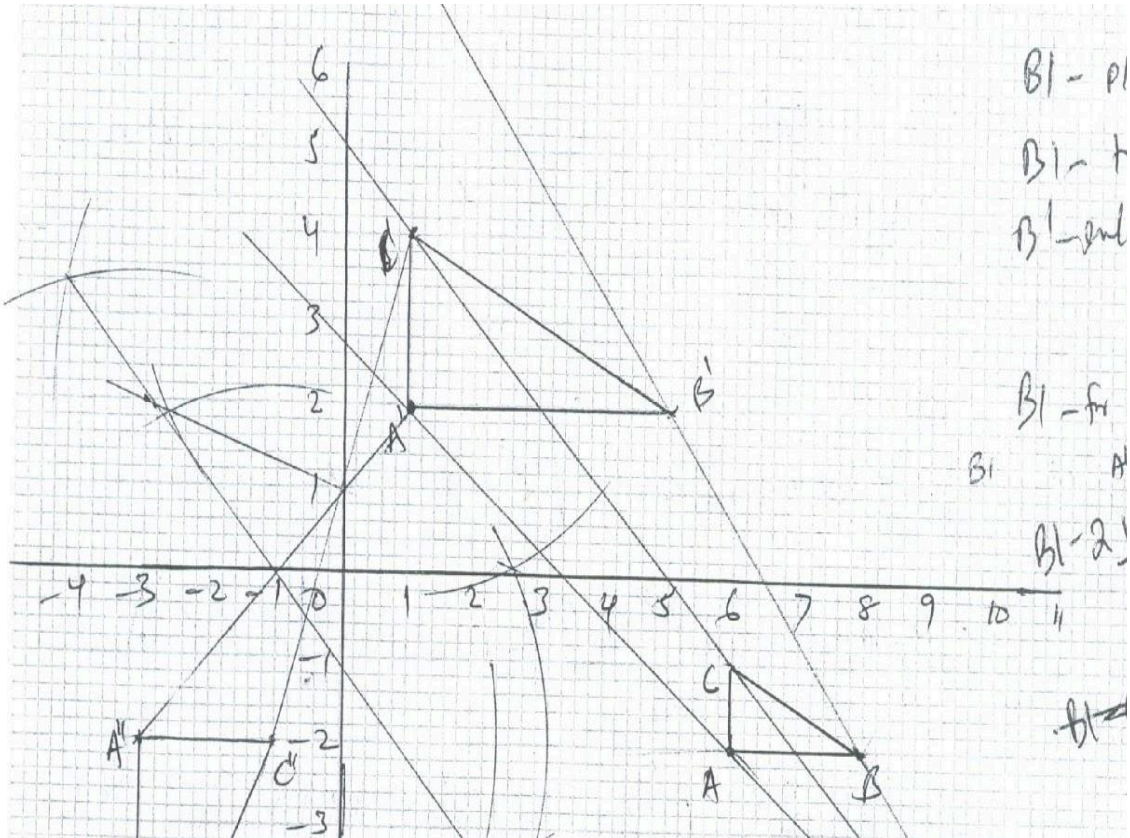
a/: $\begin{pmatrix} & \\ 0 & 4 \end{pmatrix} \begin{pmatrix} & & \\ -1 & -1 & -\frac{1}{2} \end{pmatrix} = \begin{pmatrix} & & \\ -2 & 2 & -1 \end{pmatrix}$

(c) Centre (-3,2)

Angle + 90°

$A\ \ B\ \ C$

a) $\begin{pmatrix} & \\ & \end{pmatrix} \begin{pmatrix} & & \\ & & \end{pmatrix} = \begin{pmatrix} & & \\ & & \end{pmatrix}$



11. Det $\begin{vmatrix} 2 & -3 \\ - & - \end{vmatrix} = 5$

Area of $A^1B^1C^1 = 5 \times 15$

$= 75\ cm^2$

12. $A.S.F = \frac{110}{10} = 11$

$5X(X) - -6 = 11$

$5X^2 + 6 = 11$

$5x^2 = 5$

$X^2 = 1$

$X = \pm 1$

13. Area of the image = Area of the object x Det.

Det. (Δ) = 15 – 18 = -3

$54\ cm^2 = A \times -3$

$\frac{54}{3}\ cm^2 = A$

Area of $\Delta ABC = 18\ cm^2$

14. Det. $9 + 2 = 11$

$$A^1 = \frac{1}{11}\begin{pmatrix} & \\ & \end{pmatrix}$$

$$\begin{pmatrix} & \\ & \end{pmatrix}\begin{pmatrix} \\ \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix} = \frac{1}{11}\begin{pmatrix} & \\ & \end{pmatrix}\begin{pmatrix} & \\ & \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix} = \frac{1}{11}\begin{pmatrix} \\ \end{pmatrix}$$

$$\begin{pmatrix} \\ \end{pmatrix} = \begin{pmatrix} \\ \end{pmatrix}$$

P (2, 2)