

$$\begin{pmatrix} -0.5 & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & 0.5 \end{pmatrix}$$

rotation of 180°
centre (0,0)

| | | | | | |
|---|--------------------------|--|---|----------------------------|--|
| $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ | reflection in $y = x$ | $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ | $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ | reflection in y -axis | $\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$ |
|---|--------------------------|--|---|----------------------------|--|

reflection in
 x -axis

$$\begin{pmatrix} 2 & 0 \\ 0 & -2 \end{pmatrix}$$

| | | | | | |
|---|---|---|---|--|---|
| reflection in x -axis followed by enlargement scale factor 2 centre(0,0) | reflection in x -axis then stretch scale factor 2 in x -direction and stretch scale factor 3 in y -direction | $\begin{pmatrix} 2 & 0 \\ 0 & -3 \end{pmatrix}$ | $\begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix}$ | anti-clockwise rotation about the origin through angle θ | stretch in y -direction scale factor 5 |
|---|---|---|---|--|---|

$$\begin{pmatrix} 1 & 0 \\ 0 & 5 \end{pmatrix}$$

reflection in the line
 $y = (\tan\theta)x$

| | | | | | |
|--|--|---|--|--|---|
| $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ | $\begin{pmatrix} 2 & 0 \\ 0 & 1 \end{pmatrix}$ | stretch in x -direction scale factor 2 | the matrix which transforms $\begin{pmatrix} 2 & 3 & 4 \\ 1 & 1 & 5 \end{pmatrix}$ to $\begin{pmatrix} 6 & 9 & 12 \\ 1 & 1 & 5 \end{pmatrix}$ | $\begin{pmatrix} 3 & 0 \\ 0 & 1 \end{pmatrix}$ | $\begin{pmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & -\cos 2\theta \end{pmatrix}$ |
|--|--|---|--|--|---|

the identity transformation

$$\begin{pmatrix} 0.5 & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -0.5 \end{pmatrix}$$

| | | | | | |
|---|--|---|---|--|---|
| $\begin{pmatrix} -3 & 0 \\ 0 & 3 \end{pmatrix}$ | reflection in $y = \frac{x}{\sqrt{3}}$ | $\begin{pmatrix} 0.5 & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -0.5 \end{pmatrix}$ | the matrix which transforms $\begin{pmatrix} 2 & 3 & 4 \\ 1 & 1 & 5 \end{pmatrix}$ to $\begin{pmatrix} 4 & 6 & 8 \\ 3 & 3 & 15 \end{pmatrix}$ | $\begin{pmatrix} 2 & 0 \\ 0 & 3 \end{pmatrix}$ | reflection in $y = -\frac{x}{\sqrt{3}}$ |
|---|--|---|---|--|---|

reflection in y -axis followed by enlargement scale factor 3 centre(0,0)

stretch scale factor 3 in x -direction and stretch scale factor 4 in y -direction

| | | | | | |
|--|--|------------------------|--|---|-------------------------------|
| $\begin{pmatrix} 3 & 0 \\ 0 & 4 \end{pmatrix}$ | $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$ | reflection in $y = -x$ | $\begin{pmatrix} 1 & 0 \\ 0 & 3 \end{pmatrix}$ | the matrix which transforms $\begin{pmatrix} 2 & 3 & 4 \\ 1 & 1 & 5 \end{pmatrix}$ to $\begin{pmatrix} 2 & 3 & 4 \\ 3 & 3 & 15 \end{pmatrix}$ | reflection in $y = \sqrt{3}x$ |
|--|--|------------------------|--|---|-------------------------------|

$$\begin{pmatrix} -0.5 & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & 0.5 \end{pmatrix}$$

$$\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$$

| | | | | | |
|--------------------------------|---|---|---|---|---|
| reflection in $y = -\sqrt{3}x$ | anticlockwise rotation of 90° , centre (0,0) | $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$ | clockwise rotation, 90° , centre (0,0) | $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ | enlargement, scale factor 2, centre (0,0) |
|--------------------------------|---|---|---|---|---|