**7E 3D Transformations**

$$z$$

$$x$$

$$y$$

$$z$$

$$x$$

$$y$$

$$z$$

$$y$$

$$x$$

1. A transformation U, in three dimensions, represents a reflection in the plane $z=0$.
2. Write down the $3×3$ matrix that represents this transformation.
3. Find the image of the point $\left(-1,2,3\right)$ under this transformation

Reflection in the $yz$ plane ($x=0)$

Reflection in the $xz$ plane ($y=0)$

Reflection in the $xy$ plane ($z=0)$

1. A transformation U, in three dimensions, represents a 90˚ anticlockwise rotation around the x-axis
2. Write down the $3×3$ matrix that represents this transformation.
3. Find the image of the point $\left(-1,2,3\right)$ under this transformation

Rotation anticlockwise $θ$ around the x-axis

Rotation anticlockwise $θ$ around the y-axis

Rotation anticlockwise $θ$ around the z-axis

1. The matrix $M=\left[\begin{matrix}\frac{\sqrt{3}}{2}&0&\frac{1}{2}\\0&1&0\\-\frac{1}{2}&0&\frac{\sqrt{3}}{2}\end{matrix}\right]$.
2. Describe the transformation represented by $M$.
3. Find the image of the point with coordinates $(-1,-2,1) $under the transformation represented by $M$.