

Suppose you have a point with coordinates x , y , and z . After rotating this point by Θ (specified in radians), the location will have new coordinates which we will call x' , y' , and z'

After a Θ rotation around the x -axis:

$$\begin{aligned}x' &= x \\y' &= y \cos(\Theta) - z \sin(\Theta) \\z' &= y \sin(\Theta) + z \cos(\Theta)\end{aligned}$$

After a Θ rotation around the y -axis:

$$\begin{aligned}x' &= x \cos(\Theta) + z \sin(\Theta) \\y' &= y \\z' &= -x \sin(\Theta) + z \cos(\Theta)\end{aligned}$$

After a Θ rotation around the z -axis:

$$\begin{aligned}x' &= x \cos(\Theta) - y \sin(\Theta) \\y' &= x \sin(\Theta) + y \cos(\Theta) \\z' &= z\end{aligned}$$