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# Quaternion

In quaternion rotation, assume unit circle where

# 2D Rotation

##### Maclaurin series expansion

# 3D Rotation

# Quaternion Matrix

##### Trigo Identity

##### SubSTitution

We know that:

Step 1:

1st row 2nd col:

Therefore:

1st row 3nd col:

2nd row 1st col:

2nd row 3nd col:

3rd row 1st col:

3rd row 2nd col:

Step 2:

1st row 1st col:

Step 2.5:

Step 3:

Therefore:

2nd row 2nd col:

3rd row 3rd col:

Finally: