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```
% Chapter 2 Exercise 5
clc;
clear all
close all
```

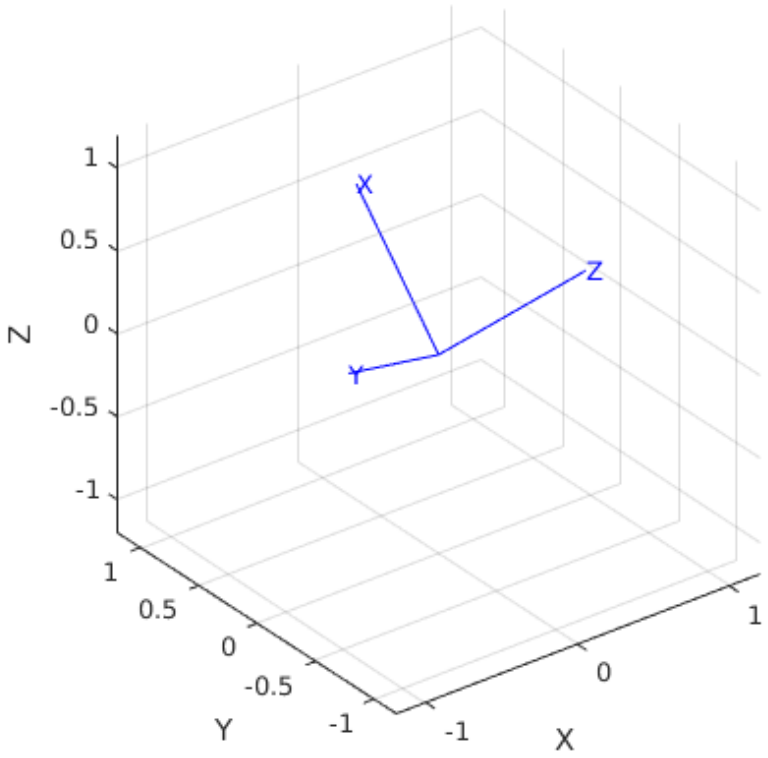
Create a 3D rotation matrix

```
phi = pi/6;
theta = -pi/4;
psi = pi/2;

R_1_0 = rotz(psi)*roty(theta)*rotx(phi)
```

```
R_1_0 =

    0.0000   -0.8660    0.5000
    0.7071   -0.3536   -0.6124
    0.7071    0.3536    0.6124
```

Create a 3D rotation matrix using trplot or tranimate

```
trplot(R_1_0)
% tranimate(R_1_0)
```



Transform a vector using the rotation matrix

```
vec_in_frame_1 = [1 1 1]'
vec_in_frame_0 = R_1_0*vec_in_frame_1
```

```
vec_in_frame_1 =

     1
     1
     1
```

```
vec_in_frame_0 =

   -0.3660
   -0.2588
    1.6730
```

Invert the rotation and multiply by the original

```
R_inv = inv(R_1_0);
result = R_inv*R_1_0
```

```
result =

    1.0000    0.0000   -0.0000
    0.0000    1.0000    0.0000
    0.0000    0.0000    1.0000
```

Reverse the multiplication and what is the result?

```
result = R_1_0*R_inv
```

```
result =

    1.0000    0.0000    0.0000
   -0.0000    1.0000   -0.0000
   -0.0000    0.0000    1.0000
```

Determinant of rotation and its inverse

```
det_R = det(R_1_0)
det_R_inv = det(R_inv)
```

```
det_R =

     1
```

```
det_R_inv =

    1.0000
```

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