Q1

```
u = [3, 1, -2]
```

```
u = 1×3
     3     1    -2
```

```
null(u)
```

```
ans = 3×2
   -0.2673    0.5345
    0.9604    0.0793
    0.0793    0.8414
```

Q2

```
V1 = [2,0,1]; V2 = [1,1,1];
A = [V1; V2];
N = null(A)
```

```
N = 3×1
   -0.4082
   -0.4082
    0.8165
```

Q3

```
A = [1 1 3; 2 -3 1]
```

```
A = 2×3
     1     1     3
     2    -3     1
```

```
B = [0; 0]
```

```
B = 2×1
     0
     0
```

```
V =  (A\B)
```

```
V = 3×1
     0
     0
     0
```

```
null(V)
```

```
ans =
1
```

Q4

```
v1 = [1 0 1]
```

```
v1 = 1×3
     1     0     1
```

```
v2 = [-2 0 0]
```

```
v2 = 1×3
    -2     0     0
```

```
v3 = [0 0 3]
```

```
v3 = 1×3
     0     0     3
```

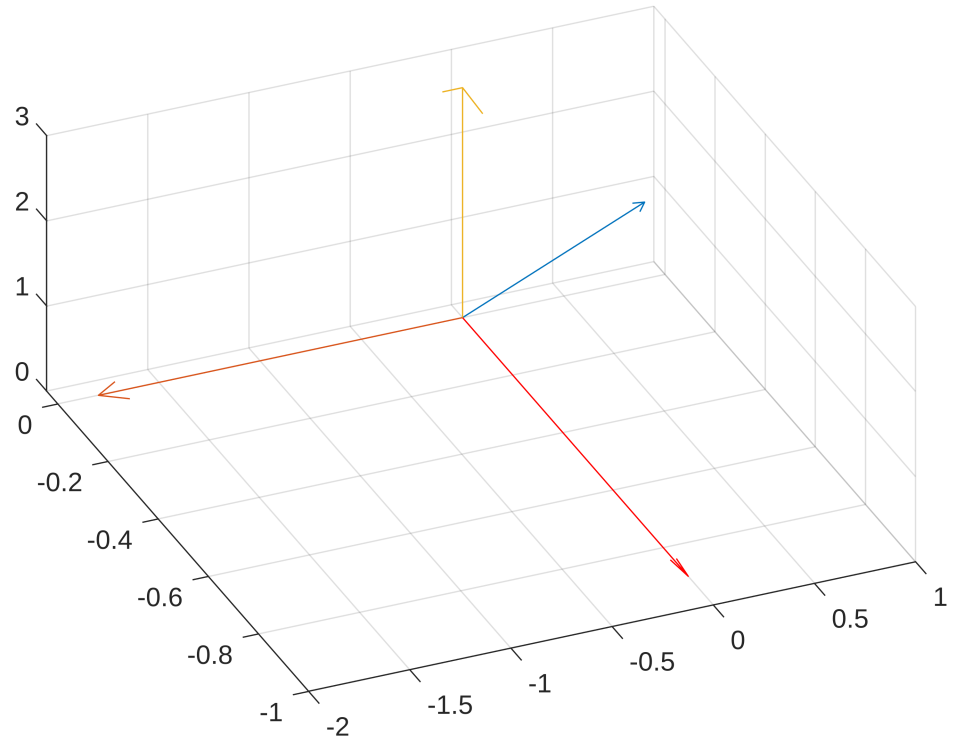
```
A = [v1; v2; v3]
```

```
A = 3×3
     1     0     1
    -2     0     0
     0     0     3
```

```
v4 = null(A)'
```

```
v4 = 1×3
    0.0000   -1.0000   -0.0000
```

```
% extras
quiver3(0,0,0,v1(1,1),v1(1,2),v1(1,3))
hold on
quiver3(0,0,0,v2(1,1),v2(1,2),v2(1,3))
quiver3(0,0,0,v3(1,1),v3(1,2),v3(1,3))
quiver3(0,0,0,v4(1,1),v4(1,2),v4(1,3),"Color","red")
```




```
hold off
```

Q5

```
v1 = [3, -5, 2]
```

```
v1 = 1×3
     3    -5     2
```

```
v2 = [2, 1, 4]
```

```
v2 = 1×3
     2     1     4
```

```
A =[v1;v2]
```

```
A = 2×3
     3    -5     2
     2     1     4
```

```
null(A)
```

```
ans = 3×1
   -0.8216
   -0.2988
    0.4855
```

Q6

```
v1 = [4, 1, -2, 0]
v2 = [-1, 2, -1, 1]
A = [v1; v2]
null(A)
```

Q7

```
V1 = [0  1 2]
```

```
V1 = 1×3
     0     1     2
```

```
V2 = [1 -1 0]
```

```
V2 = 1×3
     1    -1     0
```

```
V3 = [3  1 8]
```

```
V3 = 1×3
     3     1     8
```

```
A = [V1; V2; V3];
N = null(A)
```

```
N = 3×1
   -0.6667
   -0.6667
    0.3333
```

```
[RR,ic]=rref(A)
```

```
RR = 3×3
     1     0     2
     0     1     2
     0     0     0
ic = 1×2
     1     2
```

```
r=length(ic)
```

```
r =
2
```

```
R=RR(1:r,:)
```

```
R = 2×3
     1     0     2
     0     1     2
```

```
for i=1:size(R,1);
    for j=1:size(N,2);
        if round(dot(R(i,:),N(:,j)))==0
            disp('They are orthogonal complements of each other')
        else
            disp('They are not orthogonal complements of each other')
        end
```

```
    end
end
```

```
They are orthogonal complements of each other
They are orthogonal complements of each other
```