

feedback 4.2 6

```
w=[1;2;1;0];  
A=[-8 5 -2 0;-5 2 1 -2;10 -8 6 -3;3 -2 1 0];
```

for w to be in $\text{Col}(A)$, we need to see if there is a solution to $Ax=w$,

```
refA=rref(A)
```

```
refA = 4x4  
     1     0     -1     0  
     0     1     -2     0  
     0     0     0     1  
     0     0     0     0
```

because the system of the augmented matrix Aw is inconsistent, w is not in $\text{Col}(A)$

if w is in $\text{Nul}(A)$, $Aw=0$, we can check

```
A*w
```

```
ans = 4x1  
     0  
     0  
     0  
     0
```

therefore w is in $\text{Nul}(A)$

feedback 4.3 2

put all vecotrs in a matrix and row reduce them

```
B=[-8 8 -8 1 -9; 7 -7 7 4 3;6 -9 4 9 -4;5 -5 5 6 -1;-7 7 -7 -7 0]
```

```
B = 5x5  
    -8     8    -8     1    -9  
     7    -7     7     4     3  
     6    -9     4     9    -4  
     5    -5     5     6    -1  
    -7     7    -7    -7     0
```

```
refB=rref(B)
```

```
refB = 5x5  
 1.0000e+00      0  1.6667e+00      0  1.3333e+00  
      0  1.0000e+00  6.6667e-01      0  3.3333e-01  
      0      0      0  1.0000e+00 -1.0000e+00  
      0      0      0      0      0  
      0      0      0      0      0
```

we notice that there are pivots on the 1,2,4 columns, they will be the basis for our space

therefore the basis is

```
basis={[-8;7;6;5;-7],[8;-7;-9;-5;7],[1;4;9;6;-7]}
```

```
basis = 1x3 cell
```

	1	2	3
1	[-8;7;6;5;-7]	[8;-7;-9;-5;7]	[1;4;9;6;-7]