

## Math 210 Matlab notes for Homework #4

```
A=[-1 1 0 0 ; 0 -1 1 0 ; 1 0 -1 0 ; 0 -1 0 1 ; 0 0 -1 1];
C=diag([2 4 6 8 10]);
f=[3 1 -2 -2]';
K=A'*C*A
```

```
K = 4x4
    8    -2    -6     0
   -2    14    -4    -8
   -6    -4    20   -10
    0    -8   -10    18
```

If we were to try  $x=K\backslash f$ , matlab would warn us the system was singular or near singular. Hence we ground  $x_4 = 0$  and remove the fourth column. The other three voltages are then found this way:

```
R=K(:,1:3)
```

```
R = 4x3
    8    -2    -6
   -2    14    -4
   -6    -4    20
    0    -8   -10
```

```
x=R\f
```

```
x = 3x1
    0.4693
    0.1592
    0.0726
```

Then the node voltages are:

```
[x;0]
```

```
ans = 4x1
    0.4693
    0.1592
    0.0726
     0
```

Now find the edge currents using Ohm's Law.

```
y=-C*A*[x;0]
```

```
y = 5x1
    0.6201
    0.3464
   -2.3799
    1.2737
    0.7263
```