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## PART 4

```
clear all
close all

R1 = 1;
C = 0.25;
R2 = 2;
L = 0.2;
R3 = 10;
a = 100;
R4 = 0.1;
Ro = 1000;

% V = [V1    V2          V3    V4    V5          i1    iL    i3];
G = [-1/R1  1/R1          0    0    0          1    0    0;
      1/R1  (-1/R1)-(1/R2)  0    0    0          0   -1    0;
      0    0          -1/R3  0    0          0    1    0;
      0    0          0   -1/R4  1/R4          0    0    1;
      0    0          0    1/R4  (-1/R4)-(1/Ro)  0    0    0;
      1    0          0    0    0          0    0    0;
      0    1          -1    0    0          0    0    0;
      0    0          0    1    0          0    0    0]

% V = [V1  V2  V3  V4  V5  i1  iL  i3];
Cm = [-C  C  0  0  0  0  0  0;
       C -C  0  0  0  0  0  0;
       0  0  0  0  0  0  0  0;
       0  0  0  0  0  0  0  0;
       0  0  0  0  0  0  0  0;
       0  0  0  0  0  0  0  0;
       0  0  0  0  0  0  -L  0;
       0  0  0  0  0  0  0  0]

%B = [0 0 0 0 a*(V3/R3) 0 0 0]

I = 0;
vin = -10:1:10;
V3 = zeros(size(vin));

for Vin = -10:10
    I = I + 1;
    F = [0 0 0 0 0 Vin 0 0];
    B = [0 0 0 0 a*(V3(I)/R3) 0 0 0];
    V = ((G+Cm)\F')+B;

    V3(I) = V(3);
    Vo(I) = V(5);
end
```

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```
figure(10)
plot(vin,V3)
title('V3')
figure(11)
plot(vin,Vo)
title('Vo')
```

$G =$

*Columns 1 through 7*

-1.0000	1.0000	0	0	0	1.0000	0
1.0000	-1.5000	0	0	0	0	-1.0000
0	0	-0.1000	0	0	0	1.0000
0	0	0	-10.0000	10.0000	0	0
0	0	0	10.0000	-10.0010	0	0
1.0000	0	0	0	0	0	0
0	1.0000	-1.0000	0	0	0	0
0	0	0	1.0000	0	0	0

*Column 8*

0  
0  
0  
1.0000  
0  
0  
0  
0  
0

$Cm =$

*Columns 1 through 7*

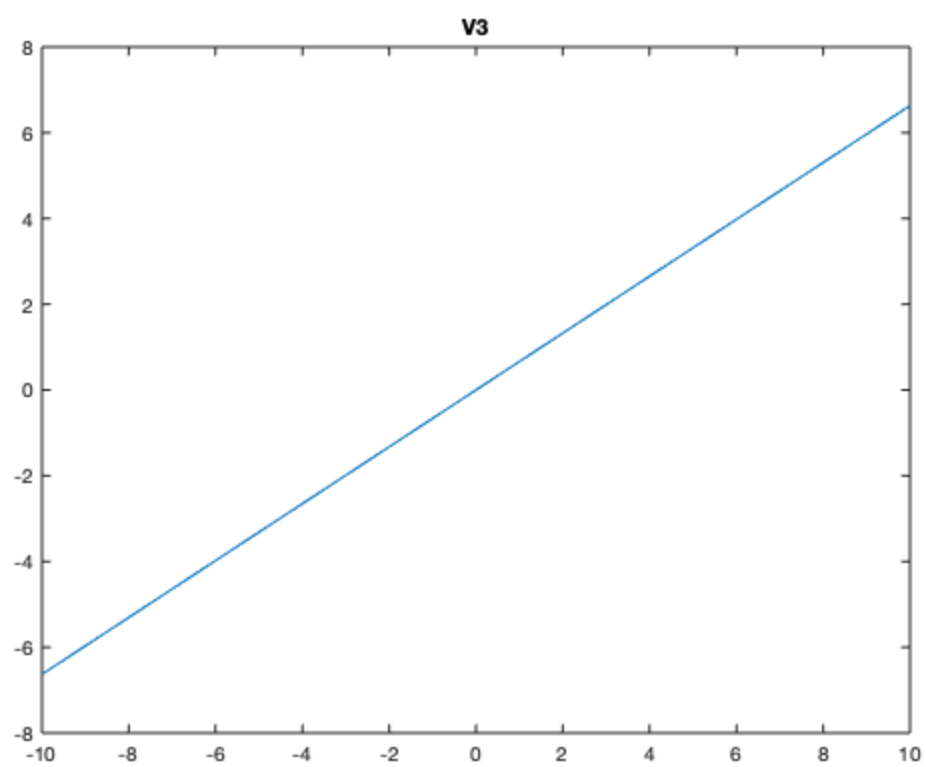
-0.2500	0.2500	0	0	0	0	0
0.2500	-0.2500	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	-0.2000
0	0	0	0	0	0	0

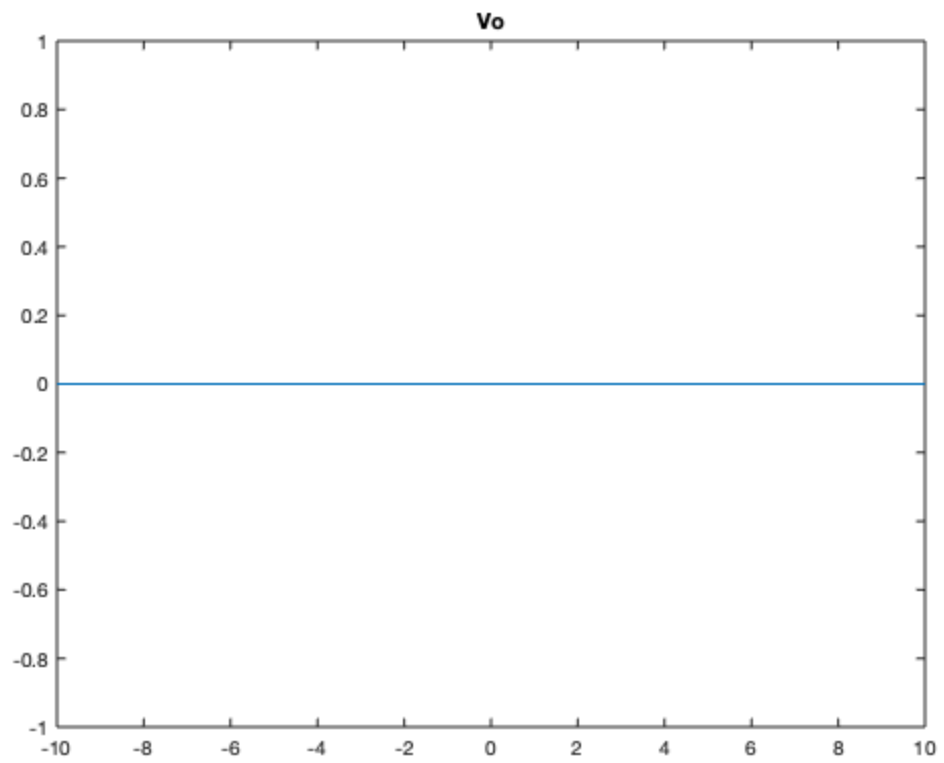
*Column 8*

0  
0  
0  
0  
0

---

0  
0  
0





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