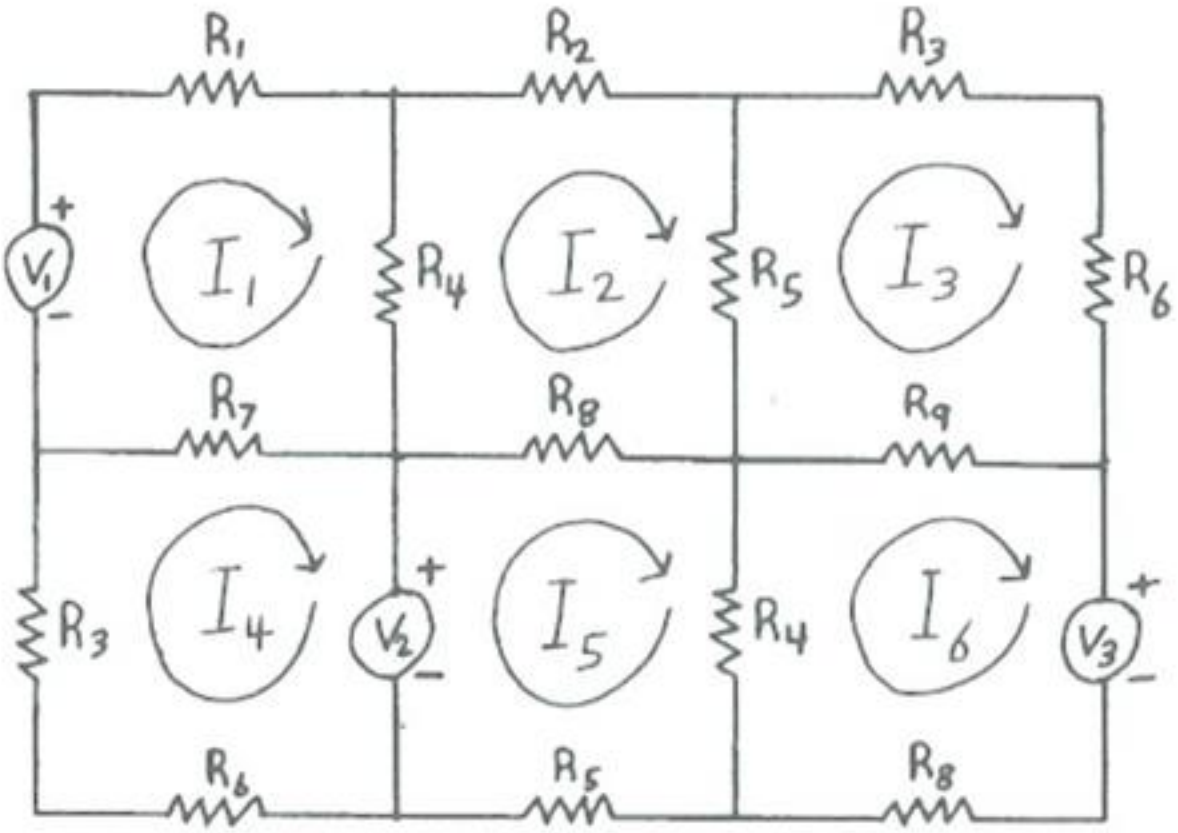
CSC 2262, Spring 2020, Lab 4a



In the electrical network shown above, the equations for the currents I_1 - I_6 are:

$$(R_1+R_4+R_7)\,I_1 - R_4I_2 - R_7I_4 = V_1$$

$$(R_2+R_4+R_5+R_8)\,I_2 - R_4I_1 - R_5I_3 - R_8I_5 = 0$$

$$(R_3+R_5+R_6+R_9)\,I_3 - R_5I_2 - R_9I_6 = 0$$

$$(R_3+R_6+R_7)\,I_4 - R_7I_1 = -V_2$$

$$(R_4+R_5+R_8)\,I_5 - R_4I_6 - R_8I_2 = V_2$$

$$(R_4+R_8+R_9)\,I_6 - R_4I_5 - R_9I_3 = -V_3$$

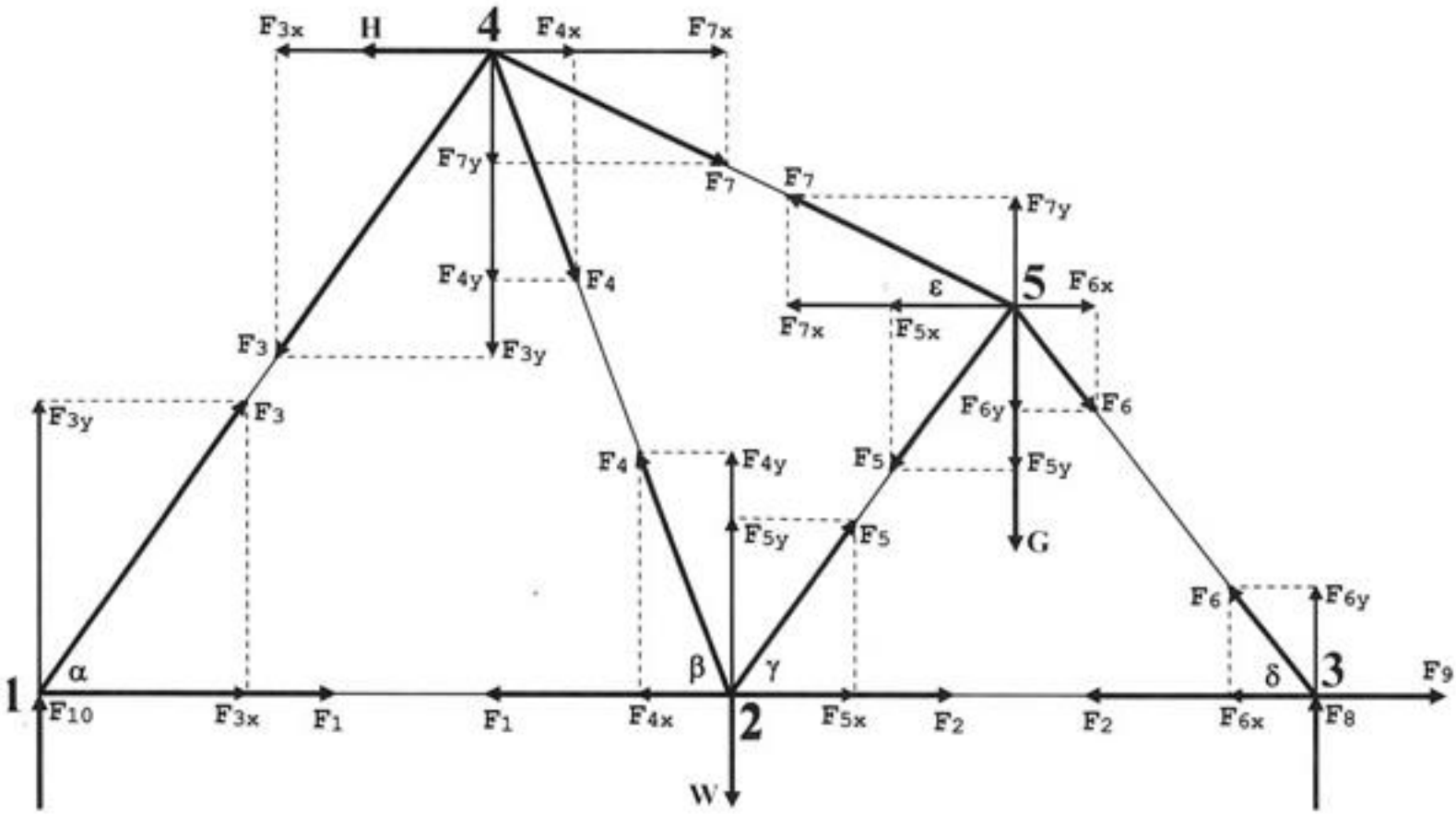
where R_1=8, R_2=2, R_3=4, R_4=9, R_5=6, R_6=1, R_7=7, R_8=3, R_9=5, V_1=130, V_2=120, and V_3=170. Write a MATLAB program to calculate and print the currents I_1 - I_6 .

The output of this program should look like this:

```
I =

    3.5027
    1.0847
   -2.6315
   -7.9568
    1.9862
   -9.7224
```

CSC 2262, Spring 2020, Lab 4b



In the triangular truss shown above, the forces in each strut act at the ends only and are parallel to the strut. External forces W and G act vertically at nodes 2 and 5, and external force H acts horizontally at node 4. The truss is supported by the vertical force F_{10} at node 1 and by the vertical force F_8 and horizontal force F_9 at node 3. The angles are α=65°, β=76°, γ=34°, δ=49°, and ε=24°, and the external forces are W=295, G=315, and H=365.

Write a MATLAB program to calculate and print the unknown forces F_1 - F_{10} .

The output of this program should look like this:

```
F =

  208.5133
  506.5563
 -493.3844
  437.6214
 -231.8023
 -215.7676
   55.4067
  162.8419
  365.0000
  447.1581
```