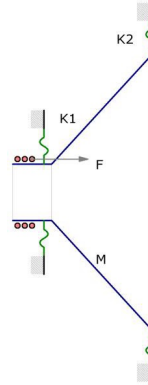
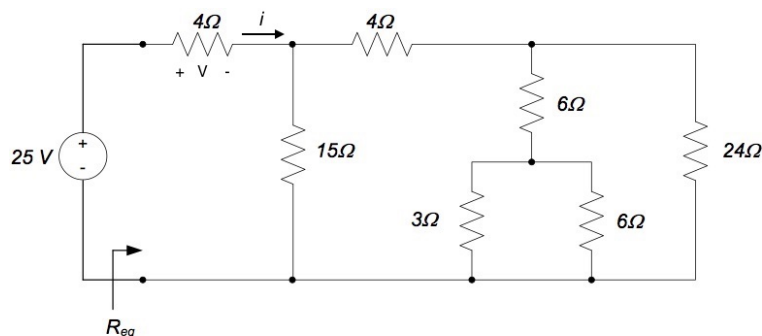


Problem 1



1. Redraw the loudspeaker driver as a mass-spring system where M is the mass of the cone, $K1$ is the stiffness of the spider and $K2$ is the stiffness of the surround. Include a ground as a reference frame.
2. Assuming the driver cone has a velocity v , define the force F in terms of its mass and stiffnesses.
3. Assuming the displacement x of the speaker can be modelled as $x = e^{j\omega t}$, express the total impedance of driver in the Laplace domain.
4. Assuming the mass of the cone is 60 grams and the stiffness of the spider and suspension to be $2 \cdot 10^3$ N/m, calculate the natural resonance frequency of the driver.

Problem 2



1. Find R_{eq} (4 points)
2. Find the voltage V and the current i (4 points)
3. Find the power absorbed by the 24Ω resistor. (3 points)

Problem 3

Find the current I using nodal analysis. (6 points)

