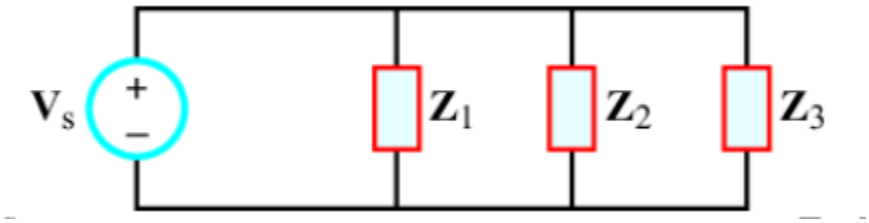
Class 21: AC Review and AC Op-Amps

Example 1:

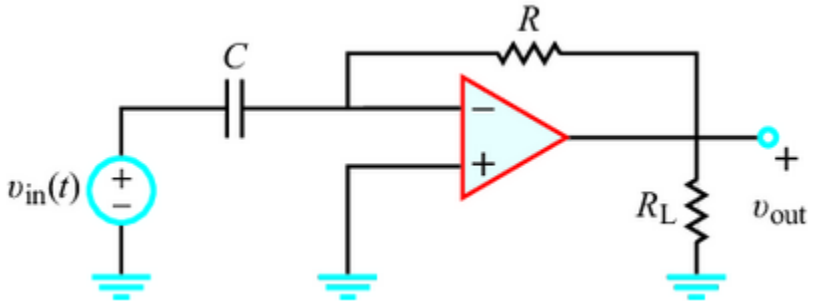


In this circuit,

- Load Z_1: Apparent power $|S| = 100$ VA at power factor (p.f.) = 0.6 lagging
- Load Z_2: Apparent power $|S| = 70$ VA at p.f. = 0.75 leading
- Load Z_3: Active power P = 45 W and p.f. = 0.95 lagging

The voltage source is $100\angle 0°$ V. Determine the total equivalent impedance. Are Z_1, Z_2, Z_3 inductive or capacitive? Hint: Find S for each load and use conservation of power.

Example 2:



Use phasor analysis and the ideal op-amp equations to find the gain V_{out}/V_{in} in terms of R, C, and the frequency ω. How does this circuit change the magnitude and phase of the input signal? How are higher or lower frequencies impacted differently?