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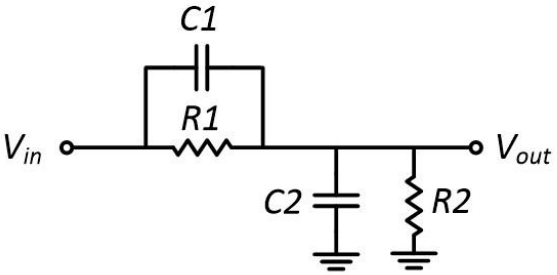
Thursday Analog Quiz



Is this a 1st order or a 2nd order circuit? Can you mention one common application for this circuit? What condition is needed so it serves in this application?

$v_{C_1} = V_{in} - V_{out}$

$v_{C_2} = V_{out}$

$v_{C_1} + v_{C_2} = V_{in}$ ⟶ 1 independent initial condition.

so network is first order.

A characteristic of this circuit is that it's "All pass" when $R_1C_1 = R_2C_2$

low-freq gain ⟶ $\frac{R_2}{R_1+R_2}$

high-freq gain ⟶ $\frac{C_1}{C_1+C_2}$

$\Rightarrow \frac{R_2}{R_1+R_2} = \frac{C_1}{C_1+C_2} \Rightarrow \boxed{R_1C_1 = R_2C_2}$

So this condition makes the magnitude constant and phase that varies with freq.