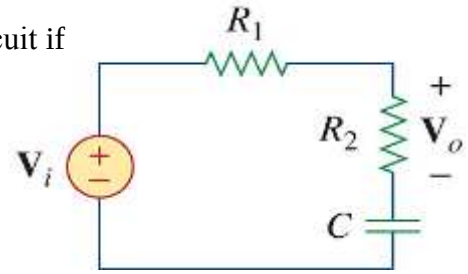
Find: The transfer function H(ω) for the following circuit if $R_1 = 10\Omega$, $R_2 = 2\Omega$, and C = 1/8F.



Voltage divider

$$\mathbf{V}_o = \frac{2}{10+2+\frac{8}{s}}\mathbf{V}_I \Rightarrow H(s) = \frac{\mathbf{V}_o}{\mathbf{V}_I} = \frac{2s}{12s+8}$$

$$\boxed{H(\omega) = \frac{j2\omega}{12j\omega+8}}$$

Find: $v_o(t)$ of the above circuit if $v_i(t) = \cos(10t)$. You'll need a calculator.

$$H(10) = \frac{j2\cdot 10}{12\cdot 10j+8} = 0.166\angle 3.8°$$

$$\boxed{v_o(t) = 0.166\cos(10t+3.8°)\,V}$$