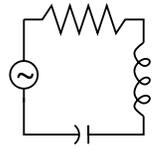


4. [13 points] Consider the RLC circuit shown to the right, below. This is modeled by $y'' + ky' + 2y = g(t)$, where $g(t)$ is the derivative of the input voltage and $0 < k < 2\sqrt{2}$ is proportional to the resistance of the resistor.

- a. [9 points] If $g(t) = 4 \cos(t)$, find the steady state response to the input. Write your answer in the form $R \cos(t - \alpha)$.



- b. [4 points] The amplitude of the steady state response to the forcing $g(t) = 4 \cos(\omega t)$ is shown below, as a function of ω . What is the value of k in the equation? Why?

