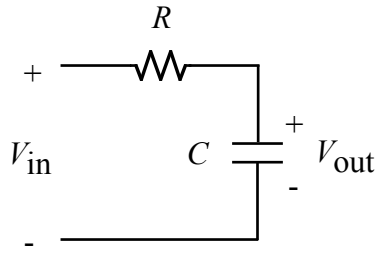
Laplace Problem #3

In the circuit below, R = 4 kΩ and C = 1 uF. The network is assumed to have no energy stored at $t = 0^-$



a) Find the network function $H(s) = \dfrac{V_{out}(s)}{V_{in}(s)}$

b) Find the impulse response $h(t)$

c) Find the step response using both the inverse Laplace method and the convolution method.

d) Find the response of this network when $v_{in}(t) = \left(3e^{-4\text{x}10^3 t}\right)\text{U}(t)[\text{V}]$ using both the inverse Laplace method and the convolution method

e) Find the response of this network when $v_{in}(t) = 2\cos(2*10^3 t)\text{U}(t)\,[\text{V}]$ using both the inverse Laplace method and the convolution method