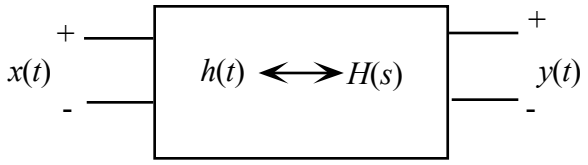
Laplace Problem 2

For the network shown below, $H(s) = \dfrac{Y(s)}{X(s)}$ is the network function and *h(t)* is the corresponding impulse response. It is known that

$$h(t) = \left[2e^{-t} + 3\cos 2t - 1.5\sin 2t\right]\mathrm{U}(t)$$



a) Find *H*(*s*) and identify its poles and zeros in the complex plane

b) Find *y*(*t*) when $x(t) = \sin(t) \bullet \mathrm{U}(t)$ by taking the inverse Laplace transform of $H(s)X(s)$. (Note: you could use the convolution theorem, but in this case it would be a LOT more work!)

Is there anything unusual or unexpected about this *y*(*t*)? Any idea of why this happened?