Consider the following system where output signal $y(t)$ is a convolution of an exponentially decaying function $h(t) = u(t) \exp(-3\pi t)$ and $x(t) = \delta T_0(t) = \sum \delta(t-k)$, where $k$ ranges from $-\infty$ to $+\infty$.

(a) What is the period of $y(t)$? ____________________ 2 points

(b) What is $\omega_0$ of $y(t)$? ____________________ 2 points

(c) Determine $C_2$ (coefficient (complex number) corresponding to $k=2$ in the Fourier Series for $y(t)$) 6 points

Show all your calculation. (You may answer in terms of $\pi$, and $\arctan$ for phase angle.)