Computer project 3

Let $\{X(t) : t > 0\}$ be a differentiable (in mean square sense, implying $c(0)$ exists), stationary Gaussian process with unit variance and mean zero. The process crosses the zero level at the random time points $t_1, t_2, \ldots$. Estimate, by means of simulation, the distribution of the random variable $X'(t_k)$, where X' denotes the derivative of X. Give an analytical derivation of the distribution of $X'(t_k)$ (this is quite hard in the general case, if you want you can consider the process in exercise 8.7.5).