[nex27] **Continuous versus discontinuous Markov process.**

The *diffusion* process is a Markov process with *continuous* sample paths and the *Cauchy* process a Markov process with *discontinuous* sample paths. Their respective conditional probability densities are

$$P(x|x_0;\Delta t) = \frac{1}{\sqrt{4\pi D\Delta t}} \exp\left(-\frac{(x-x_0)^2}{4D\Delta t}\right),$$

$$P(x|x_0;\Delta t) = \frac{1}{\pi}\frac{\Delta t}{(x-x_0)^2 + (\Delta t)^2}.$$

Determine the quantities $W(x|x_0;t)$ (jump rate), $A(x,t)$ (drift coefficient), and $B(x,t)$ (diffusion coefficient) for the two processes.