In the name of God

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STOCHASTIC PROCESSES

Exercise Set 9

(Date Due: 1400/02/31)

1. For a random-walk suppose that probability distribution of each jump is represented by $p(s) = \frac{1}{1+s^{\alpha}}$, in this case:

(a) Determine the $p(x)$ after $N-$step.

(b) Compute $\langle x \rangle_N$

(c) Compute $\langle x^2 \rangle_N - \langle x \rangle_N^2$

(d) What about $p(x)$ for $N \to \infty$?

2. For standard random-walk model we find $\sigma_x(t) \sim t^{\alpha}$ with $\alpha = 0.5$. Explain how one can derive dispersion for random-walk position with $\alpha \neq 0.5$.

Good luck, Movahed