

Quiz 5 (Friday, June 21)

AndrewID:

Name:

Total: 120 points. Full score: 100 points.

1. Let $X \sim \mathcal{N}(2, 3)$. Compute $E[X^2]$.
2. Let $X \sim \text{Uniform}(-1, 1)$, that is

$$f_X(x) = \frac{1}{2} \mathbb{1}(-1 \leq x \leq 1).$$

Let $Y = |X|$. Compute the pdf of Y , f_Y .

3. Let $X \sim \text{Uniform}(-1, 1)$. Compute the mgf of X , that is

$$m_X(t) = E[e^{tX}]$$

for $t \neq 0$.

4. Let $\{X_t\}_{t \in \{1, 2\}}$ be a Bernoulli process with parameter p . Write down the sample paths for such a process.
5. Let $\{X_t\}_{t \geq 0}$ be a Poisson process with rate λ and $T_1, \dots$ the respective inter-arrival times. Compute $P(T_1 > T | T_1 > S)$ with $S < T$.
6. Let $\{X_t\}_{t \geq 0}$ and $\{Y_t\}_{t \geq 0}$ be two independent Poisson processes with rates λ and μ respectively. Compute $E[X_t(Y_t - Y_s)]$.