Please write* *Your name: _____

Show all work. You should either write at a sentence explaining your reasoning, or annotate your math work with brief explanations. There is no need to simplify, and no calculators are needed.

. . . . . .

Let X be a discrete random variables uniformly distributed on the numbers $\{1, 2, 3\}$.

(1) Find the moment generating function for X.

(2) Find $m''(0)$.

(3) Find $\mathbb{E}X^2$ and $\mathrm{Var}X$.

(... more questions on the other side of the paper ...)

On this page $X_1, X_2, \ldots, X_{25}$ are independent identically distributed random variables and $S_{25} = \sum_{k=1}^{25} X_k$.

(1) If $X_1, X_2, \ldots, X_{25}$ are discrete random variables uniformly distributed on the numbers $\{1, 2, 3\}$, use the Central Limit Theorem to approximate $\mathbb{P}(S_{25} > 55)$. Your final answer should contain Φ, square roots, and fractions, but should not contain symbols μ, σ.

(2) If $X_1, X_2, \ldots, X_{25}$ are continuous random variables uniformly distributed on the interval $[1, 3]$, use the Central Limit Theorem to approximate $\mathbb{P}(S_{25} > 55)$. Your final answer should contain Φ, square roots, and fractions, but should not contain symbols μ, σ.