

University of California, Los Angeles
Department of Statistics

Statistics 100B

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Homework 3

EXERCISE 1

Let $X \sim N(\mu, \sigma)$.

- a. Use the properties of moment generating functions to show that $aX + b \sim N(a\mu + b, a\sigma)$.
- b. Use the cdf method to show that $aX + b \sim N(a\mu + b, a\sigma)$.

EXERCISE 2

Let $\ln(X) \sim N(\mu, \sigma)$. Find EX and $var(X)$.

EXERCISE 3

Let X_1, X_2, \dots, X_n be i.i.d. random variables with $X_i \sim \Gamma(\alpha, \beta)$. Use the properties of moment generating functions to find the distribution of $T = X_1 + X_2 + \dots + X_n$ and $\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$.