

University of California, Los Angeles
Department of Statistics

Statistics 100B

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Practice questions - gamma distribution

Let $X \sim \Gamma(\alpha, \beta)$. Answer the following questions.

- a. If $Y = \frac{X}{\beta}$ show that $Y \sim \Gamma(\alpha, 1)$.
- b. If $Y = cX$ show that $Y \sim \Gamma(\alpha, c\beta)$.
- c. Show that $\Gamma(\frac{1}{2}) = \sqrt{\pi}$.
- d. Show that $EX^k = \frac{\Gamma(\alpha+k)\beta^k}{\Gamma(\alpha)}$.
- e. We showed that $\frac{(n-1)S^2}{\sigma^2} \sim \chi_{n-1}^2$. Find the distribution of S^2 .