Statistics 100B   **Instructor: Nicolas Christou**

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 $\frac{(n-1)S^2}{\sigma^2} \sim \chi^2_{n-1}$. Find the distribution of S^2.