

1. U_1 and U_2 are two RVs drawn, independently, from $\mathcal{U}(0, 2)$ and $\mathcal{U}(0, 3)$ distributions, respectively. Find and plot the pdf of $X = U_1 + U_2$. Compute the quartile deviation of X .
2. Two RVs X and Y have a *constant* joint pdf in the following 2D region: $\begin{cases} x^2 + y^2 < 1 \\ x > 0 \end{cases}$, equal to zero elsewhere. Find and identify the distribution of $V = \frac{Y}{X}$.
3. U_1 and U_2 are two RVs drawn, independently, from $\mathcal{U}(0, 2)$. Find and identify the distribution of $Y = -\ln(U_1 U_2) + \ln 4$.
4. X and Y are two RVs drawn, independently, from χ_6^2 and χ_3^2 respectively. Find the pdf of $U = \frac{Y}{X}$. Compute the median of U .
5. X_1 and X_2 are two RVs drawn, independently, from $\mathcal{N}(0, 3)$. Find the pdf of $Y = \sqrt{X_1^2 + X_2^2}$ and its support.