

Transformations Applications

YOUR NAME

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Exercises

1. Let X be a random variable and let g be a function. By this point, it should be clear that $E[g(X)]$ is not necessarily equal to $g(E[X])$. Give one example (excluding examples from our notes) of X and g where $E[g(X)] \neq g(E[X])$. What are $E[g(X)]$ and $g(E[X])$? Use **R** to find $E[g(X)]$.
2. (From Pruim 2011, Section 2.5) Let $X \sim \text{Binom}(n, \pi)$. What is the pmf for $X + 3$? Make sure you specify the domain of Y . [Note, we have used p for the probability of success in a binomial distribution. In the Pruim text, π was used.]
3. Let $X \sim \text{Expon}(\lambda)$. Let $Y = X^2$. Find the pdf of Y .
4. ADVANCED: In exercise 3, you found the pdf of $Y = X^2$ when $X \sim \text{Expon}(\lambda)$. Rearrange the pdf to show that $Y \sim \text{Weibull}$ and find the parameters of that distribution.