

1. Let X be a random variable with density function

$$f(x) = \begin{cases} 1/4 & \text{if } x \in (-2, 2) \\ 0 & \text{if } x \notin (-2, 2). \end{cases}$$

Compute the density function of $Y = X^3$. Use the cdf technique and the transformation method and compare the results (if both techniques are appropriate). Otherwise, state why one or both of the techniques are not appropriate.