Theorem The Kolmogorov–Smirnov distribution has the variate generation property when $n \leq 4$. That is, the inverse cumulative distribution function can be obtained in closed form when $n \leq 4$.

Proof Let $X \sim$ Kolmogorov–Smirnov(n) in the all-parameters-known case. The cumulative distribution function of X is a piecewise polynomial of degree n. Because polynomials of degree greater than 4 cannot be solved in closed form, the inverse cumulative distribution function can only be obtained in closed form when $n \leq 4$.