

True/False - No explanation needed. (2pts)

1. For a symmetric distribution centered at 0, we do not have to calculate σ because it will always be 0 or not well-defined. True/False
2. Chebyshev's inequality guarantees that 75% of the sample data for any probability distribution lies within 2 standard deviations of its mean. True/False

Problems - Need justification. No justification means **zero!**

1. Let X be a geometric random variable with $p = \frac{1}{4}$. (Assume that X counts the number of failure until success.) Using Chebyshev's inequality, estimate the probability $P(X \leq 9)$. (Find a lower bound.) You can use

$$P(X \leq 9) = P(-3 \leq X \leq 9).$$

Also, compute the exact value. (10pts)