Math 220: Probability and Statistics
Chebyshev's Theorem

Example. Suppose that Y is a random variable with mean μ and variance σ^2. Find an interval (a, b) — centered at and symmetric about the mean — so that $P(a < Y < b) \geq 0.5$.

Example Suppose, in the example above, that $Y \sim N(0, 1)$. Let (a, b) be the interval you computed. What is the actual value of $P(a < Y < b)$ in this case?

Example. Suppose that Y is uniformly distributed along $[2, 12]$. Compare the bound from Chebyshev's Theorem on $P(|Y - 7| \geq 3)$ with the actual probability.

Example. Let Y be as in the example above. What does Chebyshev's Theorem tell you about $P(4 \leq Y \leq 10)$? about $P(2 < Y < 8)$?