

STAT4101 Homework 7, due October 31, 2007

Chapter 4: 59, 63, 69a, 76, 77, 78, 81, 99, 101, 118, and ...

Prove this more general form of Tchebysheff's inequality,

$$P(X \geq a) \leq \frac{E(X)}{a},$$

and show that the version in your book follows from it.

Hint: Start by writing out the expectation and splitting it into two parts, with the split on a . Then follow the same logic as in the proof in the book on page 195. To show that the version in the book follows, let $X = (Y - EY)^2$ and $a = t^2\sigma^2$, where $\sigma^2 = \text{Var}(Y)$.