1. Question 6 (DeGroot), page 232. Suppose that $X$ is a random variable for which $E(X) = \mu$ and $E((X - \mu)^4) = \beta_4$. Prove that $P((X - \mu) \geq t) \leq \beta_4/t^4$.

Use Markov’s inequality, applied to $Y = |X - \mu|^4$. Then

\[ P(|X - \mu| \geq t) = P \left(Y \geq t^4\right) \leq E(Y)/t^4 = \beta_4/t^4. \]