Chapter 7.4
Monday, Week 7

Warmup

When is $E(X + Y) = E(X) + E(Y)$ true?

When is $Var(X + Y) = Var(X) + Var(Y)$ true?

What are two formulas for $Var(X)$?

There are 3 friends who weigh an average of 150 pounds. How much can the heaviest friend weigh?

There are 10 friends who weigh an average of 150 pounds. How many friends can weigh 300 pounds or more?

Chebyshev's Inequality

Use Markov's Inequality: Ten friends weigh an average of 150 pounds. What is the maximum probability that a random friend is at least 150 pounds? How can this be?

Use Chebyshev's Inequality: The variance of the roll of a die is 35/12. What is the chance that a roll of the die is at least 5/2 from the expected value of 3/2?

Covariance

The expected sum of a pair of dice is 7 and the expected product is 12.25. If I roll the dice and the product is greater than the expected value, what can I say about the sum?

If the sum is greater than the expected value, what can I say about the product?

I flip 2 coins. Let E be the event that I get at least one head and let F be the event that I get at least one tail. What can you say about $P(F|E)$ relative to $P(F)$?