

MATH281A Homework 2

October 20, 2014

Exercise 2.1.5.

This is standard Cauchy-Schwartz inequality and its properties. You can freely use the fact that Cauchy-Schwartz inequality reaches its equity if and only if the components are linearly dependent.

Exercise 2.1.6.

A direct question. Just follow the instructions.

Exercise 2.1.8.

This is a direct application of the result you got in 2.1.5.

Exercise 2.1.17.

Method 1 requires the following steps: 1. Define an unbiased estimator $\delta(X)$; 2. Write out and expand the equation $\mathbb{E}(\delta(X)) = p^3$; 3. Compare the coefficient of p^i for all i . You need to state that X is sufficient and sufficient. Which is an obvious case here.

Exercise 2.1.18.

The first thing is to find a sufficient and complete statistic. Use the property of exponential family (What's this? See page 23 of the book) we can find that $\sum_i X_i$ is sufficient and complete. (Why? Corollary 6.16 on page 39 and Theorem 6.22 on page 42)

Then since the summation of Poisson variables is still Poisson (a well known fact), we can proceed with standard Method 1.