

You may find the Cauchy-Schwartz inequality helpful, which may be stated as:

$$E[XY] \leq \sqrt{E[X^2]E[Y^2]}.$$

1. Exercise 3.7 (page 52).
2. Problem 3.1.
3. Problem 3.2.
4. Problem 3.4.
5. Problem 3.6b.