New York University
Wilf Family Department of Politics
Fall 2013

Quantitative Research in Political Science I

Professor Patrick Egan

PROBLEM SET 3: Due Wednesday, October 16 at beginning of class.

A reminder: you may work with others in the class on this problem set, and you are in fact encouraged to do so. However, the work you submit must be your own. Handwritten work is acceptable, but word-processed work (e.g., using LaTeX) is preferred.

1. Show that
$$VAR(Y) \equiv \int_{-\infty}^{\infty} (y-\mu)^2 f(y) dy = E(Y^2) - \mu^2.$$

2. Show that
$$\begin{aligned} P(a < Y_1 \leq b, c < Y_2 \leq d) &= \int_c^d \int_a^b f(y_1, y_2) dy_1 dy_2 \\ &= F(b,d) - F(b,c) - F(a,d) + F(a,c). \end{aligned}$$

3. WMS Exercises 5.5, 5.23, and 5.49.

4. WMS Exercises 5.11, 5.79, and 5.93.

5. WMS Exercises 5.15, 5.33, and 5.59.

6. WMS Exercise 5.17.

7. WMS Exercise 5.43.

8. WMS Exercise 5.111, (a) only.