

Economics 30330: Statistics for Economics
Problem Set 0
University of Notre Dame
Instructor: Julio Garín
Spring 2012

Due Date: Beginning of class, Monday, January 23. Please complete the assignment in the allotted space. You may work in groups, but you need to turn in your own work. Please show all your work.

Review of Summations (40 points)

1. Evaluate:

(a) $\sum_{j=0}^3 2^j$

(b) $\sum_{j=0}^3 j^2$

(c) $\sum_{j=1}^5 (2j - 3)$

(d) $\sum_{j=1}^{1000} 5$

2. Show that:

(a)
$$\frac{\sum_i (X_i + Y_i) + \sum_i X_i - \sum_i Y_i}{\sum_i X_i} = 2$$

(b)
$$\frac{\sum_i (X_i^2 + 2X_i Y_i + Y_i^2) - \sum_i (X_i^2 - 2X_i Y_i + Y_i^2)}{\sum_i 8X_i Y_i} = \frac{1}{2}$$

3. Calculate/expand the following:

$$(a) \sum_{i=1}^4 i^2 =$$

$$(b) \sum_{i=1}^5 x_i^2 =$$

$$(c) \sum_{i=1}^3 x =$$

$$(d) \sum_{i=1}^n x^2 =$$

$$(e) \sum_{i=1}^n \frac{x}{n} =$$

$$(f) \sum_{i=1}^N y =$$

4. Explain the difference between $\sum_i x_i^2$ and $(\sum_i x_i)^2$. Construct an example to show that, in general, these quantities are not equal.