

PSYC 4301: Psychological Tests and Measurements

Tarleton State University

Homework 3

Spring 2020

1. On a five-item math quiz, the scores for a group of 10 students are:

Student	Item				
	1	2	3	4	5
1	1	1	0	0	0
2	1	1	1	0	0
3	1	0	0	0	0
4	1	1	1	1	1
5	1	0	1	1	1
6	0	1	0	0	0
7	1	1	1	1	0
8	1	0	0	1	0
9	1	1	0	0	0
10	1	1	1	0	1

- (a) Compute the item means p_j for $j = 1, \dots, 5$
- (b) Compute the item variances σ_j^2 for $j = 1, \dots, 5$
- (c) Compute the phi coefficient φ between items 1 and 3
- (d) Compute the phi coefficient φ between items 2 and 5
- (e) Compute the mean of the composite score X , which is defined as the sum of items 1 through 5.
- (f) Construct the variance-covariance matrix for X .
- (g) Compute the variance of the composite score X .