

## Math 21 – Summer – Week 1 Written Project (Chapters 3 & 4) Part 1 – Chapter 3

A math instructor wrote two versions of the same test and believed them to be of equal difficulty. The first version was given to a random sample of 36 students, and the second version was given to a random sample of 41 students. Your job is to help the instructor decide if the two tests were of equal difficulty, or if one of the exams was harder than the other. Here are the scores of the two versions.

### Version A

91	79	82	86	88	88	82	88
88	64	98	90	75	60	93	80
86	82	63	77	82	69	79	73
57	92	82	85	94	77	74	90
53	68	62	77				

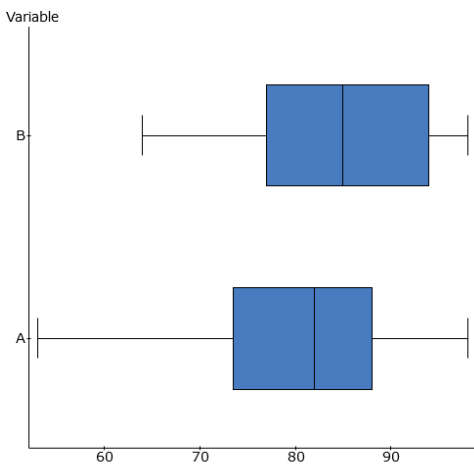
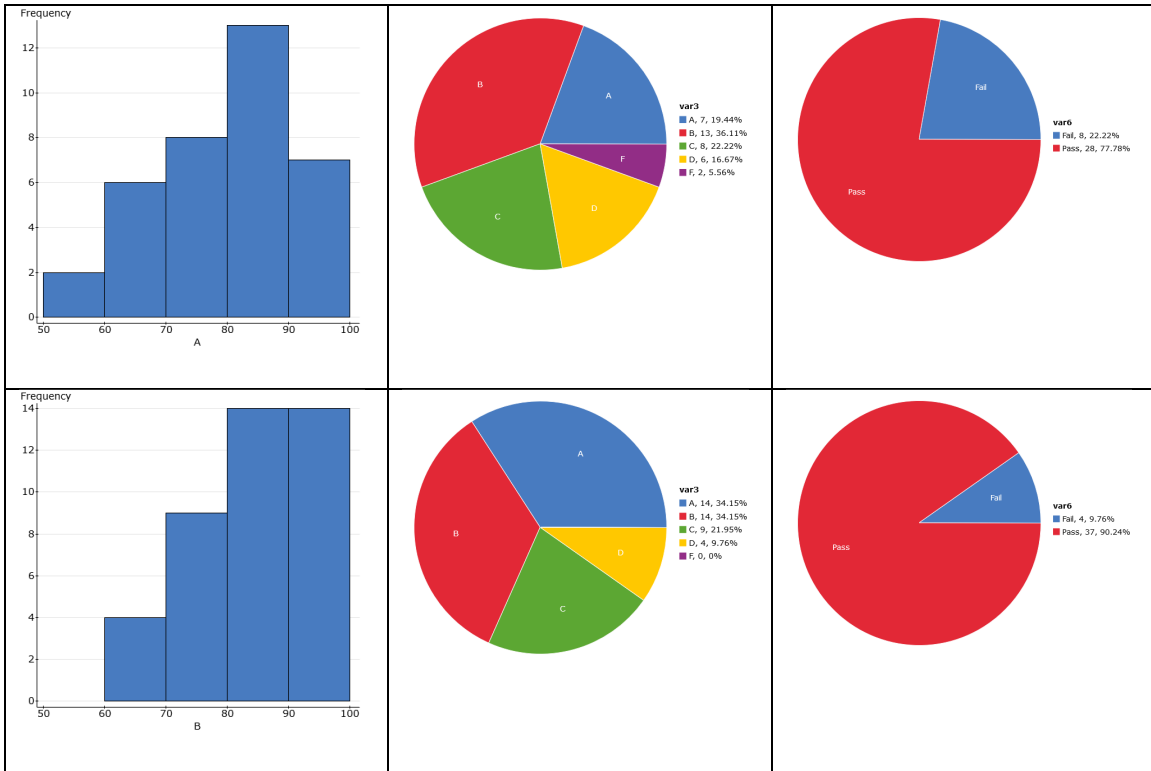
### Version B

69	84	79	94	85	96	94	79
71	94	70	86	82	91	64	86
87	87	92	69	74	95	77	95
94	80	69	98	96	87	76	91
82	89	76	95	95	72	82	82
85							

- Compute the following statistics for each test: mean, median, standard deviation.
- Create a histogram for each set of test scores.
- Create a pie chart showing the letter grade breakdown for each test. (You will need to manually count how many A's, B's, ... and to a pie chart with summary.)
- Create a pie chart showing the pass/fail breakdown for each test. (You will need to manually count how many students passed and failed, then do a pie chart w/summary.)
- Find the 5-number summary for each set of scores.
- Draw a box plot for each set of scores.

Use your results to support a paragraph that answers the question "Were the two exams of equal difficulty?"

Column	Mean	Median	Std. dev.	Column	Min	Q1	Median	Q3	Max
A	79.277778	82	11.262101	A	53	73.5	82	88	98
B	84.121951	85	9.399987	B	64	77	85	94	98



## Part 2 – Chapter 4

1) Here are the number of hours that ten students spent studying for a final exam, and their score on that exam.

<b>Hours</b>	7	8	4	9	13	5	9	6	16	3
<b>Score</b>	70	76	57	77	91	66	82	64	96	50

a) Compute the correlation coefficient  $r$ .

0.969

b) What is the  $p$ -value?

< 0.0001

c) Determine whether there is a linear association between hours studied and exam score. If so, is it positive or negative?

Yes - positive

2) Here are the scores of five randomly selected students on Test 1 and Test 2 in a math class.

<b>Student</b>	<b>Test 1 Score</b>	<b>Test 2 Score</b>
1	83	82
2	82	84
3	76	63
4	92	83
5	71	55

a) Is there a linear association between Test 1 scores and Test 2 scores?

No,  $r = 0.866$ ,  $p$ -value = 0.0576

b) Find the equation of the regression line, treating the score on Test 1 as  $x$  and the score on Test 2 as  $y$ .

Test 2 = -45.60925 + 1.4728868 Test 1

c) What is the slope of the line? What does the slope tell you?

1.47, for each increase of 1 point on Test 1, we can expect an increase of 1.47 points on Test 2.

d) Predict the Test 2 score for a student who had a score of 80 on Test 1.

72.2