Midterm Review Practice Packet

This practice packet covers all the main computations needed to master for the midterm exam. I suggest printing this packet and practicing the calculations by-hand with a calculator and the *Midterm Forumla Sheet*, as you would during the Midterm Exam. Solutions are presented on the last two pages.

Problem 1. Calculate the mean, median, and mode of the data set below.

$$1, 3, 7, 6, 3, 5, 1, 7, 8, 7$$

Problem 2. Calculate the mean, median, and mode of the data set below.

$$62, 51, 76, 92, 51, 16, 22, 51, 23, 11$$

Problem 3. Calculate the range, standard deviation, and variance of the data set in *Problem 1*.

$$1, 3, 7, 6, 3, 5, 1, 7, 8, 7$$

Problem 4. Calculate the range, standard deviation, and variance of the data set in *Problem 2*.

$$62, 51, 76, 92, 51, 16, 22, 51, 23, 11$$

Problem 5. Calculate the correlation between the two variables from *Problem 1* and *Problem 2*.

x	y
1	62
3	51
7	76
6	92
3	51
5	16
1	22
7	51
8	23
7	11

Problem 6. Calculate the correlation between the two variables in the data set below.

x	y
10	-2
1	5
5	1
4	-2
8	-6
11	7
2	-2
-3	4
-5	6
-2	2

Problem 7. Calculate the internal consistency of the scale below.

item1	item2
6	7
11	10
12	11
5	4
3	4
6	4
7	5
3	4
10	8
9	3

Use this page as extra space for your calculations for *Problem 7*.

Problem 8. Calculate the internal consistency of the scale below.

item1	item2	item3
1	1	2
5	4	1
4	5	4
3	4	4
1	2	4
5	9	4
6	1	6
4	4	4
3	2	3
1	2	1

Use this page as extra space for your calculations for *Problem 8*.

Problem 9. Intelligence (as measured by IQ) in the population is normally distributed with a mean of $\mu = 100$ and a standard deviation of $\sigma = 15$. If you take the IQ test and get a score of 118. What is your *z*-score, and how can you interpret this value?

Problem 10. Your friend takes the same IQ test that you took in *Problem 9*. He is ashamed to tell you his IQ (i.e., his raw score), but after some pressure he concedes the z-score associated with his raw score: -2.8. Calculate your friend's raw IQ score.

Solutions

Problem 1

- Mean: 4.8
- Median: 5.5
- Mode: 7

Problem 2

- Mean: 45.5
- Median: 51
- Mode: 51

Problem 3

- Range: 7
- Standard deviation: 2.6
- Variance: 6.8

Problem 4

- Range: 81
- Standard deviation: 27.0
- Variance: 730.6

Problem 5

- Correlation: -0.02

Problem 6

- Correlation: -0.38

Problem 7

- Cronbach's alpha: 0.86

Problem 8

- Cronbach's alpha: 0.58

Solutions

Problem 9

- Z-score: 1.2
- Interpretation: You are 1.2 standard deviations above the mean of intelligence. Because IQ is normally distributed and we know probabilities associated with outcomes under normal curves, only about 16% of the population is smarter than you (approximately).

Problem 10

- Raw score: 58