HOMEWORK 2

- This homework is due on Thursday, October 12th, 2000.
- You will need a calculator to solve the exercises. Please show all your calculations.

Good luck!

1. The mean of a set of scores is 8 and the standard deviation is 4. What will the new mean, standard deviation and variance be if I decide to:

		New mean	New st. deviation	New variance
(a)	add 9.8 to every score?	_____	_____	_____
(b)	subtract 5 from every score?	_____	_____	_____
(c)	multiply every score by 2.5?	_____	_____	_____
(d)	divide every score by 4?	_____	_____	_____
(e)	add 6 to each score and then divide by 2?	_____	_____	_____

2. (a) Michalis is a beginner in statistics. He was very happy though to get a 75 in his final exam in Statistics 201: Introduction to Statistical Methods. The mean was 70 and the standard deviation was 5. His friend Anastasia took a similar introductory statistics class, Education 160, and her final grade was 63 while the class mean was 50 and the standard deviation was 6. Michalis, who is still grade-oriented, was surprised to see later on his transcript that he got only a B+, while Anastasia got an A, securing a higher grade once more. Michalis is of course disappointed and is thinking of making a complaint to the instructor of Education 160. What would your advice be?

(b) He even went on to ask Anastasia a tricky question: "Is it possible to have a sample of 150 shoes of size 8 just made in a shoe factory, with a standard deviation in the length of the shoes equal to zero?" Michalis, confident in his knowledge, argued that this is not statistically possible. Do you agree with him?

3. Compare each of the following pairs of scores. Is one better than the other or are they equal?

(a) A T score of 48 and a Z score of +0.15 _____

(b) A T score of 62 and a Z score of +0.62 _____

(c) A T score of 40 and a Z score of –1.06 _____

(d) A T score of 70 and a Z score of +2.00 _____

(e) A T score of 50 and a Z score of zero _____

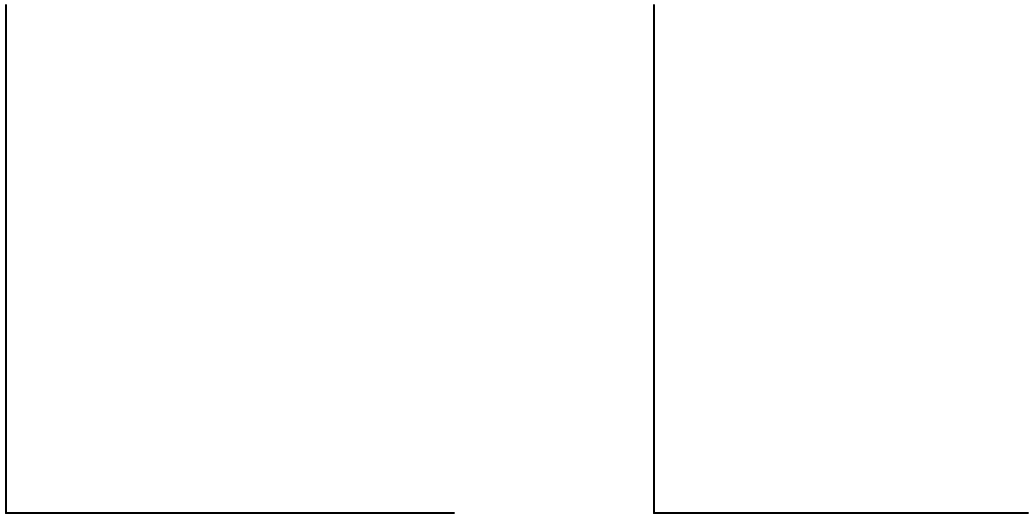
(f) A Z score of –0.08 and a raw score of 15
(raw scores have mean = 19 and stand. deviation = 2) _____

(g) A T score of 60 and a raw score of 85
(raw scores have mean = 73 and stand. deviation = 12) _____

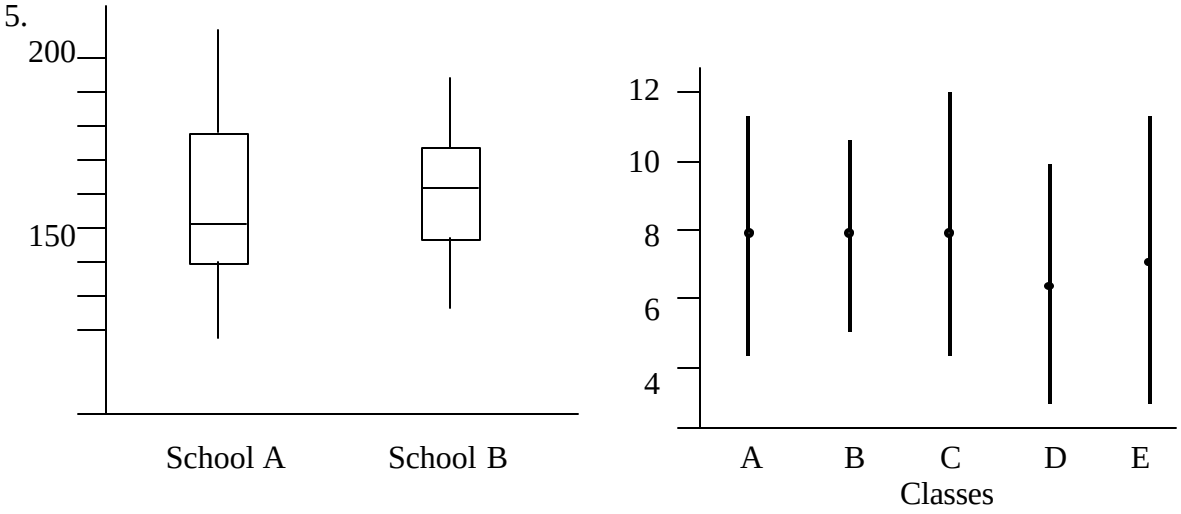
4. Consider the following stem-and-leaf diagram.

7	2 4 4
7	5 7 7 8 8 9
8	0 2 2 2 3 4 4 4
8	5 5 5 6 7 7 7 7 7 8 9
9	0 1 2 2 3 4 4
9	6 7 9 9
10	1 2
10	5 8 9
11	3
11	5 5

On the following axes draw a box-and-whisker plot and a means-on-spokes plot. Make sure to identify clearly and note the numbers for the distinctive points on each plot:



5.



- Look at the box-and-whisker plots. They represent the scores of students in a science test in two different schools. Compare the two cases referring to the median, the quartiles and the range.

- Describe the shape of the score distributions for the two schools and comment on the homogeneity of the students' achievement in the two cases.

- Now look at the Means-on-spokes diagram. What it represents is the mean basketball points (and standard deviations) obtained by the students in five middle-school classes. Each student had 8 attempts to score from a predetermined point below the basket. Assuming that you are in one of classes A, B, C and that you scored 10 points, in which case would you get a better Z score? Give a brief explanation.

- Assuming that you are in one of classes A, B, C and that you scored 8 points, in which case would you get a better Z score? Give a brief explanation.

- Now consider all 5 cases. If you scored 10 points, in which case would you get a higher Z score? Would things be different if you had scored 6 points? Why?