Sheet 2 _ Measures of Central Tendency and Variability

1. Draw a box plot for the following set of data. Remember to order the data first, if necessary.

   1, 0, 3, 2, 1, 1, 7, 8, 6, 6, 7, 7

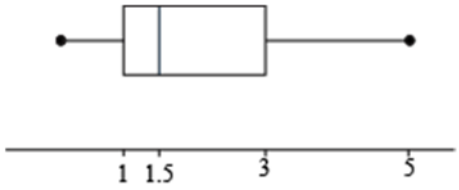
2. Draw a box plot for the following set of data. Remember to order the data first, if necessary.

   4.7, 3.8, 3.9, 3.9, 4.6, 4.5, 5

3. Draw a box plot for the following set of data. Remember to order the data first, if necessary.

   90, 77, 79, 60, 87, 87, 80, 80, 83

4. The box and whisker plot below was drawn using a list of numbers (data). Determine if each statement is definitely true, definitely false, or cannot be determined.



a) Half the data falls between 1 and 3.
b) The number 5 must be in the list of numbers from which this plot was drawn.
c) The number 1.5 must be in the list of numbers from which this plot was drawn.

5. For the following list of numbers, draw a box and whisker plot showing outliers and extreme values:

10, 12, 12, 14, 15, 16, 18, 30

6. For the following list of numbers, draw a box and whisker plot showing outliers and extreme values:

-6, 4.5, 5.5, 6.5, 8.5, 10, 12, 30

7. For the following list of numbers, draw a box and whisker plot showing outliers and extreme values:

16, 55, 78, 80, 81, 82, 84, 86, 88, 90, 105

8. The numbers of incorrect answers on a true-false competency test for a random sample of 15 students were recorded as follows: 2, 1, 3, 0, 1, 3, 6, 0, 3, 3, 5, 2, 1, 4, and 2. Find (a) the mean; (b) the median; (c) the mode.

9. The lengths of time, in minutes, that 10 patients waited in a doctor's office before receiving treatment were recorded as follows: 5, 11, 9, 5, 10, 15, 6, 10, 5, and 10. Treating the data as a random sample, find (a) the mean; (b) the median; (c) the mode.

10. The reaction times for a random sample of 9 subjects to a stimulant were recorded as 2.5, 3.6, 3.1, 4.3, 2.9. 2.3, 2.6, 4.1, and 3.4 seconds. Calculate (a) the mean; (b) the median.

11. The following measurements were recorded for the drying time, in hours, of a certain brand of latex paint.

3.4	2.5	4.8	2.9	3.6
2.8	3.3	5.6	3.7	2.8
4.4	4.0	5.2	3.0	4.8

Assume that the measurements are a simple random sample.

(a) Calculate the sample mean for these data.

(b) Calculate the sample median.

(c) Compute the sample variance and sample standard deviation.

12. According to the journal Chemical Engineering, an important property of a fiber is its water absorbency. A random sample of 20 pieces of cotton fiber was taken and the absorbency on each piece was measured. The following are the absorbency values:

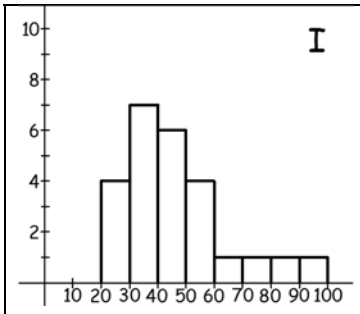
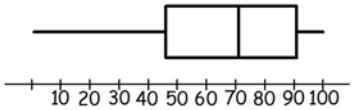
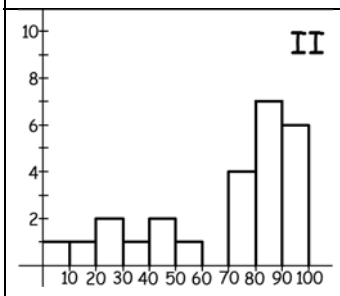
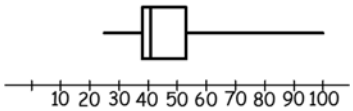
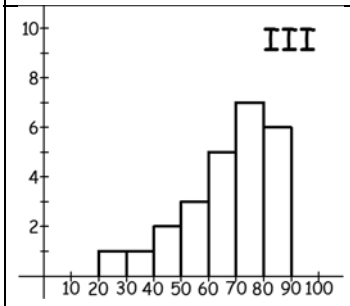
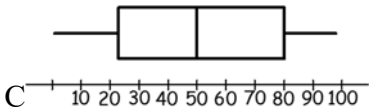
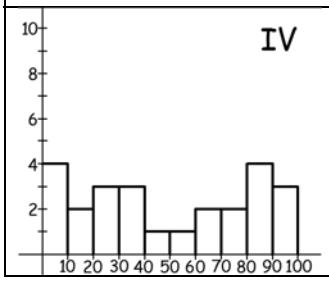
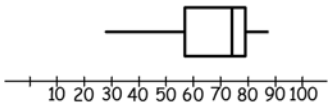
18.71	21.41	20.72	21.81	19.29	22.43	20.17
23.71	19.44	20.50	18.92	20.33	23.00	22.85
19.25	21.77	22.11	19.77	18.04	21.12	

(a) Calculate the sample mean and median for the above sample values.

(b) Do a dot plot of the absorbency data.

(c) Calculate the IQR and check for outliers.

13. Match the histograms (first column) to their corresponding boxplots (second column) and statistics (third column)

	A 	1 Mean 47.88 Median 41 Standard Deviation 19.020
	B 	2 Mean 68.72 Median 71 Standard Deviation 30.019
		3 Mean 67.8 Median 74 Standard Deviation 17.049
	D 	4 Mean 50.08 Median 50 Standard Deviation 33.625

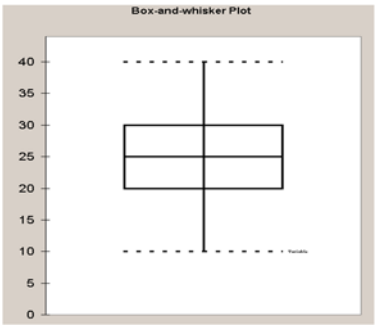
14.) Student grades on a chemistry exam were:

{77, 78, 76, 81, 86, 51, 79, 82, 84, 99}

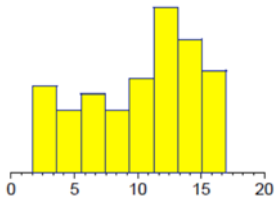
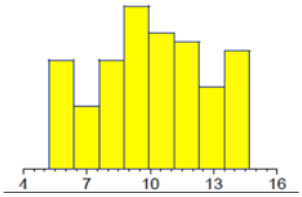
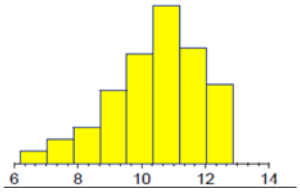
i- Are there any outliers? If so, which scores are they?

ii- What would be the score that exceeds the mean by 1.5 standard deviations?

15. Consider the opposite boxplot. Suppose 95% of the data falls between 15 and 35. What is the standard deviation of this sample of data?

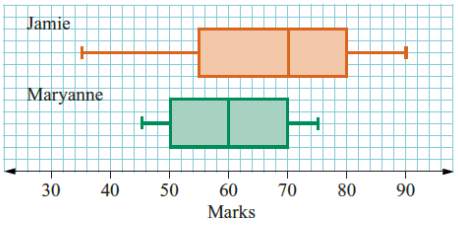


16. Mensa, the largest high-IQ society, accepts SAT scores as indicating intelligence. Assume that the mean combined SAT score is 1500, with standard deviation 300. Jacinto scored a combined 2070. Maria took a traditional IQ test and scored 129. On that test, the mean is 100 and the standard deviation is 15. From the test scores, who is more intelligent? Explain.
17. Match the following histograms to its corresponding statistics

1. 	A. Mean 10.1, Median 10.1, IQR 4.2
2. 	B. Mean 10.2, Median 11.9, IQR 6.8
3. 	C. Mean 10.5, Median 10.7, IQR 2.0

18. The average for the statistics exam was 75 and the standard deviation was 8. Andrey was told by the instructor that he scored 1.5 standard deviations below the mean. What was Andrey's exam score?

19. A class has eight assessment tasks over a year. The parallel box plots show the summary of the marks for the assessments for two students, Jamie and Maryanne.



   i. Who scored the highest mark?
   ii. Who scored the lowest mark?
   iii. What was the range of marks for each student?
   iv. Who had the greater spread of marks?
   v. What was the interquartile range for each student?

20. A highly selective university will only admit students who place at least 2 z-scores above the mean on the ACT test that has a mean of 18 and a standard deviation of 6. What is the minimum score that the applicant must obtain to be admitted to the university?