

MATHEMATICS 201-510-LW

Business Statistics

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III – Averages and Variations

1. In a study on intelligence, a psychologist records the time (in minutes) it takes for children of age 6 – 8 to complete a particular task. Here are the results for a sample of 10 children.

55 62 78 52 67 71 89 45 33 75

Find the following.

- | | |
|---------------------------|-----------------------------|
| a) the mean | b) the median |
| c) the mode | d) 10% trimmed mean |
| e) the range | f) the variance |
| g) the standard deviation | h) Coefficient of variation |
2. The nine members of the “Book Lover” club were asked to give the number of books they read each month. Here are the results.

9 5 17 9 6 8 3 4 11

Find the following.

- | | |
|---------------------------|-----------------------------|
| a) the mean | b) the median |
| c) the mode | d) 20% trimmed mean |
| e) the range | f) the variance |
| g) the standard deviation | h) Coefficient of variation |
3. A random sample of 15 customers in a grocery store was taken, and the amount of grocery bought (in dollars) was noted. Here are the results.

4.52 9.63 11.45 25.31 31.45 31.98 46.30 62.12
65.07 71.13 85.26 89.19 94.12 126.90 194.52

Find the following.

- | | |
|---------------------------|-----------------------------|
| a) the mean | b) the median |
| c) the mode | d) 15% trimmed mean |
| e) the range | f) the variance |
| g) the standard deviation | h) Coefficient of variation |

4. In a study on family life, a sociologist electronically monitored a number of randomly chosen homes to determine the number of hours the family television was on during a 24-hour period. Here are the results.

Number of Hours	Frequency
0 – 4	6
5 – 9	5
10 – 14	8
15 – 19	4
20 – 24	2

- a) Use this distribution to estimate the mean number of hours the family television is on during a 24-hour period.
- b) Use this frequency distribution to estimate the standard deviation of the number of hours the family television is on during a 24-hour period.
5. The following frequency distribution shows the ages for a sample of 400 mathematics instructors at various CEGEP's.

Age	Frequency
25 – 34	31
35 – 44	49
45 – 54	142
55 – 64	163
65 – 74	15

- a) Use this frequency distribution to estimate the mean age of those instructors surveyed.
- b) Use this frequency distribution to estimate the standard deviation of the ages of those instructors surveyed.
6. The price (in \$) for a random sample of six new personal computers sold in Quebec city is given below.

890 999 1149 1250 1750 2300

- a) Find the mean and standard deviation for the price of a new personal computer.
- b) Use Chebyshev's theorem to find an interval centered about the mean for the price of a new personal computer in which you would expect at least 75% of the prices to fall.
7. The average speed for a random sample of cars passing on a certain portion of Highway 20 was 115 km/h with a standard deviation of 8 km/h.
- a) Use Chebyshev's theorem to find an interval centered about the mean for the speed of cars on Highway 20 in which you would expect at least 75% of the speeds to fall.
- b) Use Chebyshev's theorem to find an interval centered about the mean for the speed of cars on Highway 20 in which you would expect at least 93.8% of the speeds to fall.

8. Here are the IQ scores obtained by a sample of 30 SLC students on an intelligence test.

107	99	144	92	123	105	105	85	98	101
111	92	105	96	96	101	112	134	123	133
74	87	104	87	109	87	113	155	86	79

- Make a box-and-whisker plot of the data.
- Find the interquartile range.
- If Mary-Jane obtained a score of 101, into what quartile does this score fall?

9. The ages of 39 randomly selected CEO of small companies is listed below.

26	31	31	36	37	37	40	41	44	45
46	47	47	48	50	50	50	51	51	52
53	54	54	55	55	55	55	56	56	57
58	59	59	59	61	62	63	66	75	

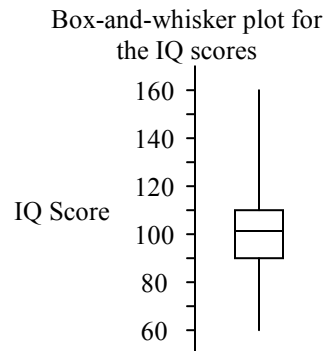
- Make a box-and-whisker plot of the data.
- Find the interquartile range.
- If John is 54, into what quartile does he fall?

10. Do questions 1 -5 and 8 – 9 on Excel. Note that some of the answers in questions 8 and 9 may differ.

ANSWERS

1. a) 62.7 minutes b) 64.5 minutes c) None d) 63.1 minutes
e) 56 minutes f) 281.6 minutes² g) 16.8 minutes h) 26.8%
2. a) 8 books b) 8 books c) 9 books d) 7.4 books
e) 14 books f) 16.2 books² g) 4.03 books h) 50.3%
3. a) \$ 63.26 b) \$ 62.12 c) None d) \$ 55.76
e) \$ 190 f) 2585 dollars² g) \$ 50.84 h) 80.4%
4. a) 10.2 hours b) 6.27 hours
5. a) 51.55 years b) 9.75 years
6. a) \$1390 \$536 b) Between \$317 and \$2462
7. a) between 99 km/h and 131 km/h. b) between 83 km/h and 147 km/h.

8. a) Min = 74
Q₁ = 92
Median = 102.5
Q₃ = 112
Max = 155
b) 20
c) Second quarter



9. a) Min = 26 years
Q₁ = 45 years
Median = 52 years
Q₃ = 57 years
Max = 75 years
b) 12 years
c) Third quarter

