Englische Übungen zu Statistik

1. Compute arithmetic mean, median and mode of the following numbers:
   14, 18, 11, 23, 20, 18, 17, 14, 19, 13, 18, 16

2. In a survey 20 students said that they have no siblings, 16 students have one sibling, 9 students have two siblings and 5 have three siblings. Compute the weighted arithmetic mean in order to find out how many siblings these students have on average.

3. A school has three fourth grades: classes 4A, 4B and 4C. Class 4A has 25 students which are on average 160,1 cm tall, class 4B has 23 students who are on average 156,8 cm tall and class 4C has 22 students who are on average 159,3 cm tall. Compute how tall the average fourth grader is in this school.

4. Yvonne is training for a swimming competition. During her training she swam 50m in the following times:
   45,7 sec 44,2 sec 47,1 sec 43,8 sec 45,0 sec 45,3 sec
   Find the minimum, the maximum and the range.

5. The following temperatures were measured over the course of a day.

time	1:00	4:00	7:00	10:00	13:00	16:00	19:00	22:00
temp.	12°C	10°C	11°C	18°C	22°C	24°C	22°C	17°C

   Compute the arithmetic mean and the standard deviation of these temperatures.

6.

a. Compute the first, second and third quartile of the following values:
23, 24, 24, 26, 27, 28, 29, 29, 30, 30, 30, 31, 33, 34, 36; (n=15)

b. Draw a boxplot.

7. Are the following statements true or false? Explain why. Give a counterexample, if possible.

a. The arithmetic mean is always larger than the median.
b. At least 75% of the values are larger than the first quartile.
c. The variance is the square of the standard deviation.
d. The arithmetic mean of any data is never negative.
e. The standard deviation of any data is never negative.

Vocabulary

Englisch	Deutsch
arithmetic mean	arithmetisches Mittel
median	Median, Zentralwert
mode	Modus
weighted	gewichtet
average	Durchschnitt
fourth grader	Viertklässler
range	Spannweite
standard deviation	Standardabweichung
quartile	Quartil
variance	Varianz
data	Daten
counterexample	Gegenbeispiel

Solutions

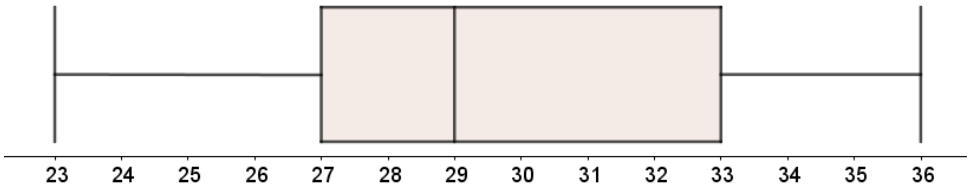
1. Arithmetic mean = 16,75; median = 17,5; mode = 18

2. On average, they have 1 sibling (0,98).

3. 158,8 cm (158,764…)

4. Minimum = 43,8 sec; maximum = 47,1 sec; range = 3,3 sec

5. Arithmetic mean = 17°C; standard deviation ≈ 5,5°C (5,477…)

6.
   a. $q_1 = 26;\ q_2 = 29; q_3 = 31$
   b. 

7.
   a. False. A possible counterexample is the list 1, 4, 4 with median 4 and arithmetic mean 3.
   b. True. This is part of the definition of the first quartile.
   c. True. This is exactly how the standard deviation is defined.
   d. False. A possible counterexample is the data list -3, 0, 0 (which might come from temperatures measured on a winter's day). Their arithmetic mean is -1, which is negative.
   e. True. The standard deviation is the square root of the variance and the variance is nonnegative since it is a sum of squares.