Measures of Spread

The **measures of spread** of a data set are quantities that indicate how closely a set of data clusters around its centre. Just as there are several measures of central tendency, there are also different measures of spread.

Range

The **range** is the difference between the highest and lowest values in a set of data.
The *larger* the range, the more spread out the set of data.
The *smaller* the range, the closer together the set of data.

Ex) The test scores on the last quiz were as follows:
  68, 72, 86, 61, 83, 74, 72, 89, 55, 91, 42
  Find the range.

Standard Deviation

The **standard deviation** shows, on average, how much the data deviates from the mean.
The *larger* the standard deviation, the more spread out the set of data.
The *smaller* the standard deviation, the closer together the set of data.

$$s = \sqrt{\dfrac{sum\_of\_the\_squared\_deviations}{n}}$$	**STEPS:** 1 – mean 4 – total 2 – deviations 5 – divide by n 3 – deviations squared 6 – square root

What the "real" formulas look like:

Ex) For a game of basketball, a group of girls split into two randomly chosen teams. The heights of the players are shown in the tables below. Find the standard deviation.

Team 1

Player	Height (cm)	Deviations	Deviations Squared
Player 1	183		
Player 2	165		
Player 3	148		
Player 4	146		
Player 5	181		
Player 6	178		
Player 7	154		

Team 2

Player	Height (cm)	Deviations	Deviations Squared
Player A	166		
Player B	163		
Player C	168		
Player D	161		
Player E	165		
Player F	166		
Player G	166		

Examples

For each question below:
a) Find the range of the data.
b) Find the standard deviation of the data.

Round the *mean* and *standard deviation* to **one decimal place**. **Do not** round off at any other point in your solution.

1. The percent of employees that have university degrees at eight major corporations in Toronto:

Corporation	Percent of Employees
Corporation 1	68
Corporation 2	74
Corporation 3	80
Corporation 4	32
Corporation 5	70
Corporation 6	62
Corporation 7	76
Corporation 8	72

1. a) 48 **b)** 14.1

2. The scores on a grade 9 geometry quiz:

Student	Score
Student A	88
Student B	56
Student C	72
Student D	67
Student E	59
Student F	48
Student G	81
Student H	62

2, a) 40 **b)** 12.4

3. The number of home runs hit by players on the Statsville little league team in 2007:

Player	Number of Home Runs
Player 1	6
Player 2	4
Player 3	3
Player 4	8
Player 5	9
Player 6	11
Player 7	6

Answers
3. a) 8 **b)** 2.6