

Algebra 1 · Statistics: Center, Spread and Data Displays · Worksheet

Common Core S-ID.A.1, S-ID.A.2, S-ID.A.3 · mathovore.fr

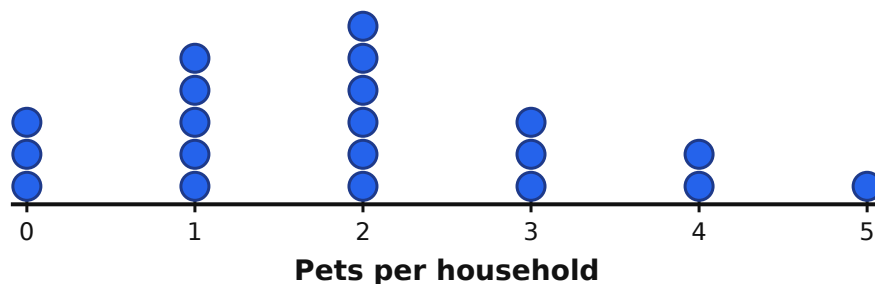
Name: _____ Date: ____/____/____ Score: _____

These 24 problems practice one-variable data analysis for S-ID.A.1, S-ID.A.2 and S-ID.A.3. Read dot plots, histograms and box plots, compute the mean, median, IQR and standard deviation, compare distributions, and decide how outliers change center and spread. The last six problems are real-world word problems.

Algebra 1 Common Core: S-ID.A.1 · S-ID.A.2 · S-ID.A.3

Problem 1: Read a dot plot

The dot plot shows the number of pets in each of several households. (a) How many households were surveyed? (b) Find the mode. (c) How many households have at least 3 pets? (d) Find the range.



Pets per household in a survey.

Problem 2: Find the mean

Find the mean of each data set. (a) Maya's quiz scores: 8, 9, 7, 10, 6, 9, 8, 7. (b) Prices at a farmers market: \$12, \$15, \$9, \$20, \$14.

Problem 3: Find the median

Find the median of each data set. (a) 14, 9, 21, 12, 17. (b) 30, 25, 28, 35, 22, 31.

Problem 4: Quartiles and IQR

Find the median, Q_1 , Q_3 and the IQR of the minutes Liam spent reading each night: 6, 9, 12,

7, 15, 11, 8, 14, 10, 13.

Problem 5: Five-number summary

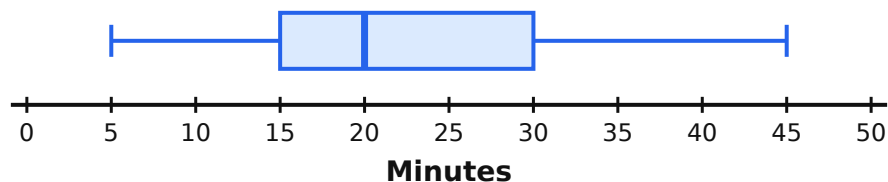
Find the five-number summary, the range and the IQR of these 11 temperatures in degrees Fahrenheit: 22, 35, 28, 31, 25, 40, 33, 29, 26, 38, 30.

Problem 6: Draw a box plot

A data set has minimum 12, $Q_1=18$, median 23, $Q_3=30$ and maximum 41. Draw a box plot on a number line from 10 to 45. Then find the range and the IQR.

Problem 7: Read a box plot

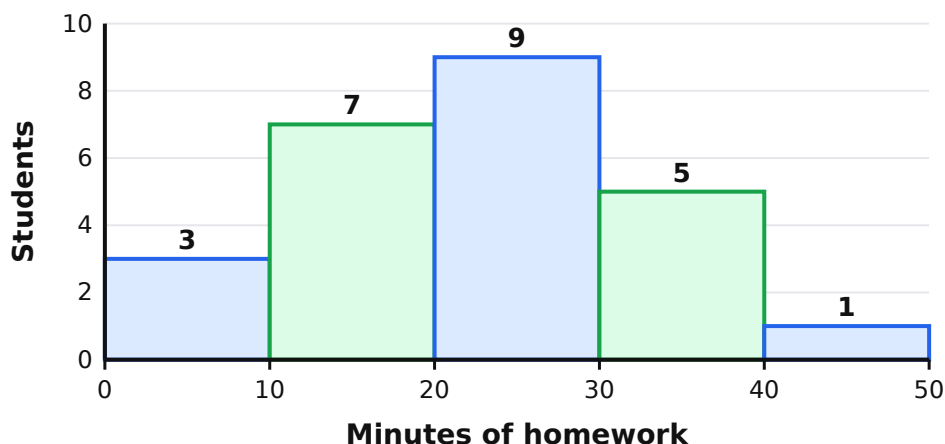
The box plot shows daily practice time for a group of students. Find the five-number summary, the range and the IQR. What percent of the students practiced more than 30 minutes?



Minutes of practice per day for a group of students.

Problem 8: Read a histogram

The histogram shows nightly homework time for a class. (a) How many students are represented? (b) How many students did 10 or more but fewer than 30 minutes? (c) In which interval is the median? (d) Can the exact mean be found from the histogram? Explain.



Homework minutes for 25 students; each bar includes its left edge.

Problem 9: Build a histogram

These are the waiting times in minutes of 16 patients at a clinic: 3, 7, 12, 14, 15, 18, 21, 22, 23, 25, 26, 28, 31, 34, 37, 44. Make a frequency table with intervals 0 to 10, 10 to 20, 20 to 30, 30 to 40 and 40 to 50 (each includes its left edge), then draw the histogram.

Problem 10: Mean from a frequency table

The table shows goals scored by a soccer team in 20 games.

Goals	0	1	2	3	4
Games	4	6	5	3	2

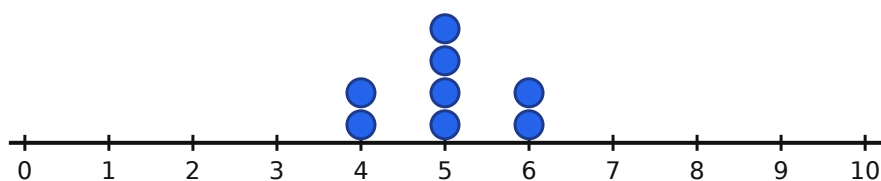
Find the mean and the median number of goals.

Problem 11: Standard deviation by hand

Jamal made 2, 3, 3, 3, 5 and 8 points in six games. Find the mean and the standard deviation of his scores, treating them as the whole group.

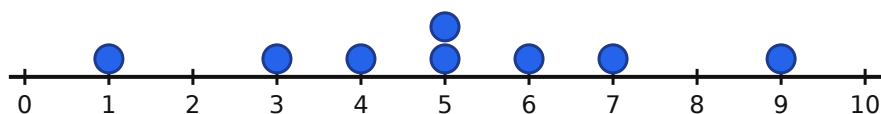
Problem 12: Compare spread visually

Both dot plots have a mean of 5. Without calculating, which data set has the larger standard deviation? Then calculate both standard deviations to the nearest hundredth.



Data set A

Data set A.



Data set B

Data set B.

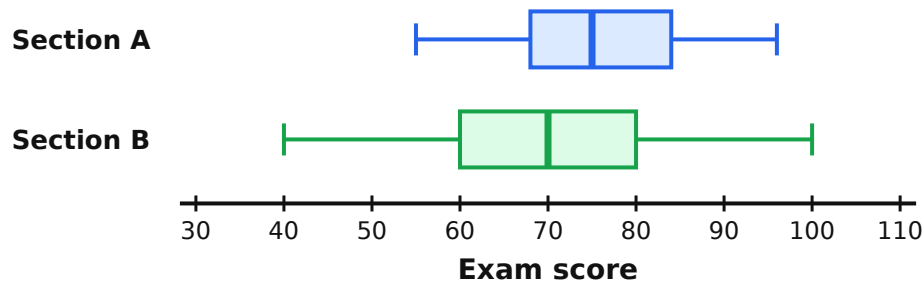
Problem 13: Interpret standard deviation

Two bus routes both have a mean delay of 6 minutes. Route 1 has a standard deviation of 1 minute. Route 2 has a standard deviation of 5 minutes. Which route is more predictable?

Would a 15-minute delay be more surprising on Route 1 or on Route 2? Explain.

Problem 14: Compare box plots

The box plots show exam scores for two sections of a course. Compare the centers and the spreads. Which section performed better overall, and which was more consistent?



Exam scores for two sections.

Problem 15: Test for outliers

Use the $1.5 \times \text{IQR}$ rule to decide whether the data set 12, 14, 15, 15, 16, 17, 18, 19, 21, 38 has any outliers.

Problem 16: Effect of an outlier

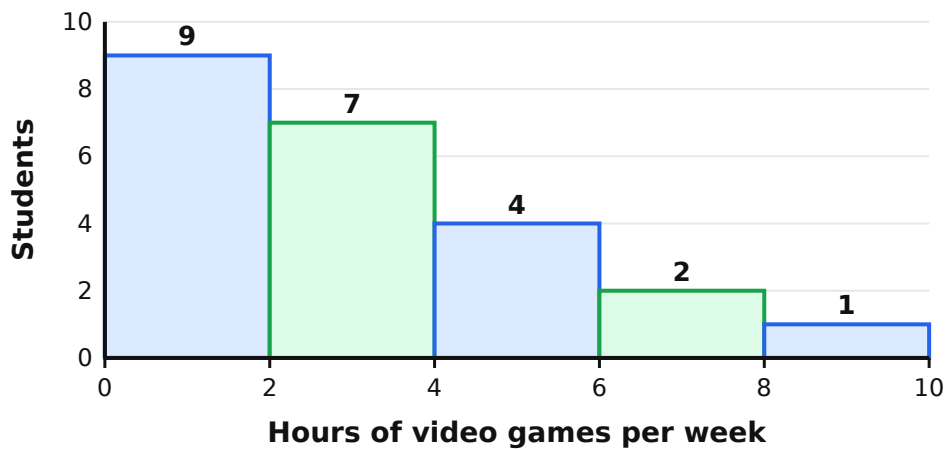
Find the mean and median of 4, 5, 6, 7, 8. Then add the value 31 and find the mean and median again. Which statistic changed more?

Problem 17: Choose the best measures

For each situation, choose the better pair of measures: (mean and SD) or (median and IQR). Explain. (a) Home prices in a town with a few very expensive mansions. (b) Heights of 30 classmates, roughly symmetric with no outliers. (c) Daily high temperatures for a month that includes one day of 110 degrees when all other days are between 70 and 82.

Problem 18: Describe the shape

Describe the shape of this distribution. Is the mean probably greater than, less than, or about equal to the median? Which measures of center and spread should be used?



Weekly video game hours for 23 students.

Problem 19: Basketball points

Diego scored these points in 10 basketball games: 12, 15, 9, 22, 14, 11, 18, 15, 13, 21. (a) Find the mean. (b) Find the median and the IQR. (c) Find the standard deviation. (d) In an eleventh game Diego scores 40. Find the new mean and median, and tell which one changed more.

Problem 20: Commute times

Five-number summaries of commute times in minutes: City A: 10, 18, 25, 32, 50. City B: 15, 22, 25, 28, 35. Find each IQR, compare the two cities and decide which has the more predictable commute.

Problem 21: Missing quiz score

Aisha's mean on five quizzes is 84. Her first four scores are 80, 92, 78 and 85. What did she score on the fifth quiz? What is the median of all five scores?

Problem 22: Home prices

Six homes on a street sold for (in thousands of dollars) 210, 225, 230, 240, 245 and 255. Find the mean and median. Then a mansion sells for 1,200. Find the new mean and median. Which measure better describes a typical home?

Problem 23: Cookie weights

Cookies from two bakeries weigh (in ounces) Bakery A: 1.8, 1.9, 2.0, 2.1, 2.2; Bakery B: 1.5, 1.8, 2.0, 2.2, 2.5. Show that both means are 2.0 ounces, find each standard deviation to the nearest hundredth, and say which bakery makes cookies of more consistent size.

Problem 24: Two classes

On the same test, Class 1 had a mean of 78 with a standard deviation of 4 points. Class 2 had a mean of 78 with a standard deviation of 12 points. Find the interval from one standard deviation below the mean to one standard deviation above it for each class. Which class would you expect to have more scores above 90? Which has more similar scores?