

Goals

At the end of this section, students should be able to:

- find the first, second, and third quartiles of a data set
- find the interquartile range of a data set
- represent a data set graphically using a box-and-whisker plot
- interpret other fractiles such as percentiles
- find and interpret the standard score (z-score)

Fractiles

- numbers that divide an ordered data set into equal parts
- for example, a median divides an ordered data set into two equal parts

Quartiles

- approx. divide an ordered data set into four equal parts
- about one quarter of data falls on or below the first quartile (Q1)
- about one half of data falls on or below the second quartile (Q2)
- about three quarters of data falls on or below the third quartile (Q3)

Try It Yourself 1, p. 87

a. 0, 1, 1, 1, 2, 2, 2, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6, 6, 7, 7, 8, 8, 7, 10, 10, 10, 11, 11,
11, 12, 12, 13, 15, 16, 16, 17, 17, 21, 21, 22, 23, 24, 25, 25, 26, 27, 27, 28, 28,
29, 30, 31, 31, 32, 32, 33, 33, 34, 36, 39, 41, 42, 45, 46, 47, 48, 49, 50, 50, 51,
52, 53, 54, 55, 56, 63

b. median (Q2) =

c. Q1 = median of lower half =

Q3 = median of upper half =

Using Technology to Find Quartiles

Try It Yourself 2, p. 89

--work together

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Interquartile range (IQR)

--difference between first and third quartiles

-- $IQR = Q3 - Q1$

Try It Yourself 3, p. 89

a. $Q1 =$; $Q3 =$

b.

c.

Box-and-whisker plot

--highlights important features of a data set

--requires five-number summary to graph

--see Guidelines on p. 90

Try It Yourself 4, p. 90

a. min:

Q1:

Q2:

Q3:

Max:

bc.

d.

Other Fractiles

Quartiles

--divide a data set into 4 equal parts

Deciles

--divide a data set into 10 equal parts

Percentiles

--divide a data set into 100 equal parts

Try It Yourself 5, p. 91

a.

b.

The Standard Score

--“z-score”

--number of deviations a given value falls from the mean

--see formula on p. 92

z-score can be negative, positive, or zero

--if negative, corresponding x value is below the mean

--if positive, corresponding x value is above the mean

--if zero, corresponding x value is equal to the mean

Try It Yourself 6, p. 92

a. mean:

std dev:

b. for $x = 60$

for $x = 71$

For $x = 92$

c. A bill of \$60 is

A bill of \$71 is

A bill of \$92 is

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Assign:

2.5 Exercises, pgs. 93-96