**LINK**

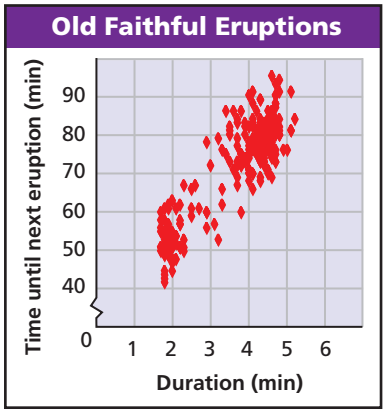
## Geology

The Old Faithful Geyser at Yellowstone National Park can send 8500 gallons of boiling water to a height of 185 feet.

**For a data set with a first quartile of Q1 and a third quartile of Q3, a value less than Q1 – 1.5(IQR) or greater than Q3 + 1.5(IQR) may be considered to be an outlier. Use this rule to identify any outliers in each data set. Show your work.**

**26.** $\{2, 3, 4, 5, 5, 25\}$ **27.** $\{91, 90, 79, 15, 82, 90, 88\}$ **28.** $\{1, 36, 34, 33, 35, 92\}$

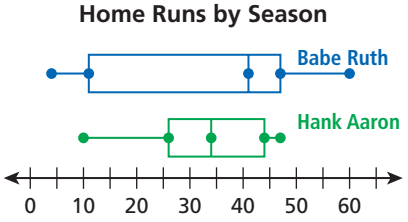
**Geology** **Use the graph of 222 eruptions of the Old Faithful Geyser for Exercises 29 and 30.**




**29.** The duration has a mean of 3.6 min and a standard deviation of 1.1 min. What duration time intervals would be outliers? Describe any outliers for duration on the graph.

**30.** The time between eruptions has a mean of 71 min and a standard deviation of 12.8 min. What time intervals would be outliers? Describe any outliers for time intervals on the graph.

**Estimation** **Use the box-and-whisker plots for Exercises 31–34.**




**31.** Which player hit the most home runs in a season? By approximately how many home runs did he do so?

**32.** Which player had the greater median number of home runs? Estimate how much greater.

**33.** Estimate the interquartile range for both players.

**34.** Which data set has the smaller standard deviation? Explain.

**35.** You have a 0.1% chance of winning \$500 and a 99.9% chance of losing \$1. What is the expected value of your gain? (*Hint*: The two possible outcomes for this "experiment" are + 500 and −1.)

**36.** Suppose that you have a 10% chance of winning \$100, a 30% chance of losing \$2, and a 60% chance of breaking even. What is the expected value?

**37.** ERROR ANALYSIS Two students attempt to find the standard deviation of 4, 6, 8, and 10. Which is incorrect? Explain the error.

**A**

$7 - 4 = 3 \rightarrow 9$
$7 - 6 = 1 \rightarrow 1$
$7 - 8 = -1 \rightarrow 1$
$7 - 10 = -3 \rightarrow 9$
$20 \div 4 = 5$
$\sqrt{5} \approx 2.24$

**B**

$7 - 4 = 3 \rightarrow 3$
$7 - 6 = 1 \rightarrow 1$
$7 - 8 = -1 \rightarrow 1$
$7 - 10 = -3 \rightarrow 3$
$8 \div 4 = 2$
$\sqrt{2} \approx 1.41$

H.O.T. **38. Write About It** Is an expected value always, sometimes, or never a value in the data set? Give an example to justify your answer.

H.O.T. **39. Games** In a game, you multiply the values of two number cubes.

**a.** What is the expected value of this product?

**b.** What is the probability that a product is greater than the expected value?

**c.** What is the probability that a product is less than the expected value?

**d.** Are the answers to parts **b** and **c** equal? Explain.