## Review Exercises

**1. Old Faithful** The table below lists measurements from eight different eruptions of the Old Faithful geyser in Yellowstone National Park. The data consist of the duration (sec) of the eruption, height (ft) of the eruption, time interval (min) before the eruption, and time interval (min) after the eruption. Shown below are Minitab results obtained by using the durations and interval-after times.

**a.** Determine whether there is sufficient evidence to support a claim of a linear correlation between duration and interval-after time for eruptions of the Old Faithful geyser.

**b.** What percentage of the variation in interval-after times can be explained by the linear correlation between interval-after times and durations?

**c.** Letting $y$ represent interval-after time and letting $x$ represent duration time, identify the regression equation.

**d.** If an eruption has a duration of 200 sec, what is the best predicted value for the time interval after the eruption to the next eruption?

Eruptions of the Old Faithful Geyser

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Duration | 240 | 120 | 178 | 234 | 235 | 269 | 255 | 220 |
| Height | 140 | 110 | 125 | 120 | 140 | 120 | 125 | 150 |
| Interval Before | 98 | 90 | 92 | 98 | 93 | 105 | 81 | 108 |
| Interval After | 92 | 65 | 72 | 94 | 83 | 94 | 101 | 87 |

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Pearson correlation of DURATION and AFTER = 0.926
P-Value = 0.001

The regression equation is
AFTER = 34.8 + 0.234 DURATION
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**2. Old Faithful** Refer to the table of data given in Exercise 1 and use the heights and interval-after times.

**a.** Construct a scatterplot. What does the scatterplot suggest about a linear correlation between heights of eruptions and interval-after times?

**b.** Find the value of the linear correlation coefficient and determine whether there is sufficient evidence to support a claim of a linear correlation between heights of eruptions and interval-after times.

**c.** Letting $y$ represent the interval-after time and letting $x$ represent height, find the regression equation.

**d.** Based on the given sample data, what is the best predicted interval-after time for an eruption with a height of 100 ft?

**3. Old Faithful** Refer to the table of data given in Exercise 1 and use the durations and heights.

**a.** Construct a scatterplot. What does the scatterplot suggest about a linear correlation between duration and height?

**b.** Find the value of the linear correlation coefficient and determine whether there is sufficient evidence to support a claim of a linear correlation between duration and height.

**c.** Letting $y$ represent height and letting $x$ represent duration, find the regression equation.

**d.** If an eruption has a duration of 200 sec, what is its best predicted height?