## Lessons 2.1–2.4

**1. MULTI-STEP PROBLEM** The table below shows the time of the sunrise on different days in Galveston, Texas.

| Date in 2006 | Time of sunrise (Central Standard Time) |
|---|---|
| Jan. 1 | 7:14 A.M. |
| Feb. 1 | 7:08 A.M. |
| Mar. 1 | 6:45 A.M. |
| Apr. 1 | 6:09 A.M. |
| May 1 | 5:37 A.M. |
| June 1 | 5:20 A.M. |
| July 1 | 5:23 A.M. |
| Aug. 1 | 5:40 A.M. |

a. *Describe* the pattern, if any, in the times shown in the table.

b. Use the times in the table to make a reasonable prediction about the time of the sunrise on September 1, 2006.

**2. SHORT RESPONSE** As shown in the table below, hurricanes are categorized by the speed of the wind in the storm. Use the table to determine whether the statement is *true* or *false*. If false, provide a counterexample.

| Hurricane category | Wind speed $w$ (mi/h) |
|---|---|
| 1 | $74 \leq w \leq 95$ |
| 2 | $96 \leq w \leq 110$ |
| 3 | $111 \leq w \leq 130$ |
| 4 | $131 \leq w \leq 155$ |
| 5 | $w > 155$ |

a. A hurricane is a category 5 hurricane if and only if its wind speed is greater than 155 miles per hour.

b. A hurricane is a category 3 hurricane if and only if its wind speed is less than 130 miles per hour.

**3. GRIDDED ANSWER** Write the next number in the pattern.

1, 2, 5, 10, 17, 26, . . .

**4. EXTENDED RESPONSE** The graph shows concession sales at six high school football games. Tell whether each statement is the result of *inductive reasoning* or *deductive reasoning. Explain* your thinking.
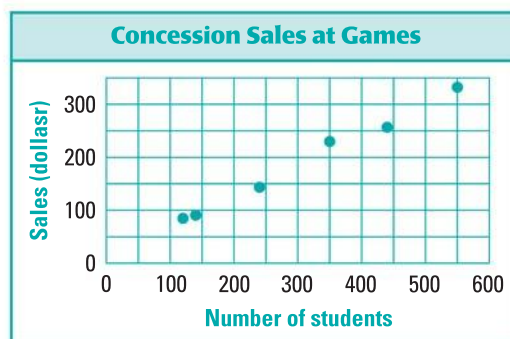


a. If 500 students attend a football game, the high school can expect concession sales to reach $300.

b. Concession sales were highest at the game attended by 550 students.

c. The average number of students who come to a game is about 300.

**5. SHORT RESPONSE** Select the phrase that makes the conclusion true. *Explain* your reasoning.

a. A person needs a library card to check out books at the public library. You checked out a book at the public library. You (*must have, may have,* or *do not have*) a library card.

b. The islands of Hawaii are volcanoes. Bob has never been to the Hawaiian Islands. Bob (*has visited, may have visited,* or *has never visited*) volcanoes.

**6. SHORT RESPONSE** Sketch a diagram showing $\overleftrightarrow{PQ}$ intersecting $\overleftrightarrow{RS}$ at point $N$. In your diagram, $\angle PNS$ should be an obtuse angle. Identify two acute angles in your diagram. *Explain* how you know that these angles are acute.