**2.3 Assignment Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**To Be or Not To Be a Function?**

**Defining and Recognizing Functions**

 **1.** A history teacher asks six of her students the number of hours that they studied for a recent test. The following diagram maps the grades that they received on the test to the number of hours that they studied.



**a.** Is the relation a function? If the relation is not a function, state why not.

**b.** Write the set of ordered pairs to represent the mapping.

**c.** What does the first value in each ordered pair in part (b) represent? What does the second value in each ordered pair represent?

**d.** Complete the following scatter plot. Does the graph agree with your conclusion from part (a)? Explain your reasoning.



 **2.** Suppose a teacher asks six students the number of hours they studied, and the set of ordered pairs was {(100, 6), (90, 5), (80, 3), (70, 1), (90, 4), (80, 2)}. Create a mapping from this set of ordered pairs.

**a.** Is the relation a function? If the relation is not a function, state why not.

**b.** List all the inputs of the relation.

**c.** List all the outputs of the relation.

**d.** Instead of mapping grades to hours studied, the teacher decides to create a new diagram for her first set of students. This diagram maps hours studied to grades. Show the mapping that would result.

**e.** Write the set of ordered pairs to represent the mapping in part (d).

**f.** Is the relation in part (d) a function? If the relation is not a function, state why not.

**g.** Complete the scatter plot shown. Does the graph agree with your conclusion from part (f)? Explain your reasoning.



 **3.** At the end of the year, a principal decides to create the following mapping.

Input: The 82 total students in the history class

Output: The final grades they received for the class

Does this mapping fit the definition of a function? Explain your reasoning.

 **4.** Suppose a teacher writes the following equation that relates the amount of time the students studied to their final grades.

*y* = 10*x* + 40

Let *x* represent the number of hours studied and *y* represent the grade.

**a.** Determine whether the equation is a function. Explain your reasoning.

**b.** List three ordered pairs that are solutions to the equation.

**c.** What conclusion can the students make about the relationship between hours studied and grade?