FUNCTIONS, CONTINUED: GRAPHICAL REPRESENTATIONS

VI. Representations of Functions as Graphs

We have discussed verbal and tabular representations of functions. Many functions can also be represented as graphs.

A. Discuss with your group the following questions:

- What does it mean to plot points on coordinate axes?
- What is the definition of the *graph* of a function?

B. Carefully draw the graphs below on graph paper.

1. Draw the graph of the function *f* represented by the table:

x	0	1.5	3	5.5
$f(x)$	4	6	1.5	0

   What are the domain and range of f ?

2. Draw the graph of the function *g* represented by the table:

x	0	1	2	3	4	5
$g(x)$	1	3	5	7	9	11

   What are the domain and range of g ?

3. After drawing the graph of the function *g* in (2), connect the plotted points with a solid line. This graph represents a **new function**, which we'll call *h*.
   a. How does the function *h* differ from the function *g*?
   b. What is the domain of the function *h*?
   c. What is the range of the function *h*?
   d. Give the coordinates of a point on the graph of *h* that was *not* on the graph of *g*. What can you conclude from the fact that this point is on the graph of the function *h*?

4. Draw the graph of the function *f* defined as follows.
   - *f* sends each real number between 0 and 2, inclusive, to the number 5.
   - *f* sends each real number between 3 and 5, inclusive, to the number 2.
   - *f* sends each real number between 6 and 10, inclusive, to the number 3.
   a. What is the domain of the function f ?
   b. What is the range of f ?
   c. Without using a calculator, find the values of
   $$f(\pi), \ f(1.3), \ f(\sqrt{2}), \text{ and } f(\sqrt{52}).$$

5. Draw the graph of the function *g* that sends each real number between 0 and 5, inclusive, to itself. What are the domain and range of g ?