## **1**. [14 points]

The entire graph of a function f(x) is shown to the right. Also shown is a table of some values for two functions g(x) and h(x).

x	0	1	2	4
g(x)	2	-1	5	4
h(x)	0	0.5	0	8

The function g(x) is defined for all real numbers and is **periodic** with a period of 5.



- **a**. [3 points] Find the value of each of the following; write N/A if a value does not exist or there is not enough information to find it. Showing work is not required, but may be eligible for partial credit in some cases.
  - (i) h(f(1)) = \_\_\_\_\_\_
  - (ii)  $g(\sin(20\pi)) =$  \_\_\_\_\_
  - (iii)  $g(f^{-1}(-1)) =$  \_\_\_\_\_\_
- **b.** [3 points] Suppose that we know further that h(x) is a polynomial of **degree 3** with a double zero at x = 2. Combining this new knowledge with what's given in the table, find a formula for h(x). Show all work.

*h*(*x*) = \_\_\_\_\_

c. [6 points] The piecewise function f(x) consists of a linear piece and an exponential piece. Write a piecewise formula for the function f(x). Show all needed work.



**d**. [2 points] Find the domain of the function  $f^{-1}(y)$  (not f(x)).

Domain of  $f^{-1}(y)$ : \_\_\_\_\_