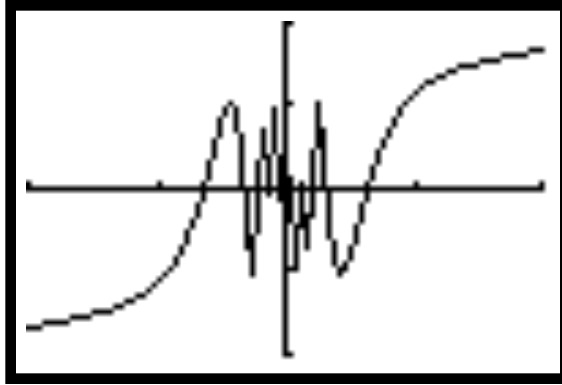
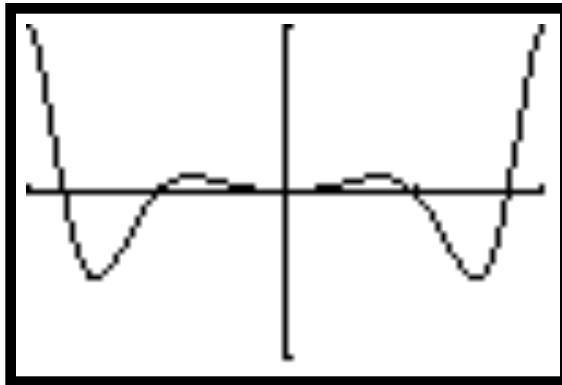


Homework Assignment 1: Due at the beginning of class 6/27/01

1. Could the following graph possibly represent the graph of a function? Explain why or why not.



2. Could the following graph possibly represent the graph of a function? Explain why or why not.



3. What is the mathematical definition of a function as a complete sentence (or several complete sentences)? If a function is represented as a graph, how would the definition that you wrote in part be translated into graphical terms?

The eleven states with the most hazardous waste sites¹ are shown in Table 1.1 below. (Use the information in this table to answer Questions 4 and 5.)

State	Nonfederal Waste Sites	Federal Waste Sites
New Jersey	102	6
Pennsylvania	91	6
California	68	23
New York	75	4
Michigan	72	0
Florida	47	6
Washington	33	14
Wisconsin	39	0
Illinois	34	4
Ohio	30	3
Oklahoma	30	3

Table 1.1: States with the Most Hazardous Waste Sites (1998).

4. Is the number of Federal Waste Sites a function of the number of Nonfederal waste sites? Represent the relationship using an arrow diagram.
5. Is the number of Nonfederal Waste Sites a function of the number of Federal waste sites? Represent the relationship using an arrow diagram.

Table 1.2 (below) lists the female winners of the Boston marathon from 1980 to 1999. (Use Table 1.2 to answer questions 6 and 7.)

Year	Athlete	Time
1980	Jacqueline Gareau	2:34:28
1981	Allison Roe	2:26:46
1982	Charlotte Teske	2:29:33
1983	Joan Benoit	2:22:43
1984	Lorraine Moller	2:29:28
1985	Lisa Larsen-Weidenbach	2:34:06
1986	Ingrid Kristiansen	2:24:55
1987	Rosa Mota	2:25:21
1988	Rosa Mota	2:24:30
1989	Ingrid Kristiansen	2:24:33
1990	Rosa Mota	2:25:24
1991	Wanda Panfil	2:24:18
1992	Olga Markova	2:23:43
1993	Olga Markova	2:25:27
1994	Uta Pippig	2:21:45
1995	Uta Pippig	2:25:11
1996	Uta Pippig	2:27:12
1997	Fatuma Roba	2:28:03
1998	Fatuma Roba	2:23:21
1999	Fatuma Roba	2:23:25

Table 1.2: Female winners of the Boston Marathon (1980-1999)

¹ Source: Environmental Protection Agency.

6. Is the female winner of the Boston marathon a function of year? What about the fact that Fatuma Roba has won the marathon from 1997 to 1999?

7. Is winning time a function of athlete? Explain why or why not.

Extra credit: Which two athletes are from New Zealand?

Table 1.3 (below) shows the percentage of people who had completed 4 years or more of high school and four years or more of college². In this problem, you will investigate whether or not there is a connection between whether or not high school graduation affects college graduation. (Use Table 1.3 to answer questions 8, 9 and 10.)

Year	Percentage of People with 4 or more years of high school	Percentage of People with 4 or more years of college
1940	24.5	4.6
1950	34.3	6.2
1959	43.7	8.1
1970	55.2	11.0
1980	68.6	17.0
1991	78.4	21.4
1991	79.4	21.4
1993	80.2	21.9
1994	80.9	22.2
1995	81.7	23.0
1996	81.7	23.6
1997	82.1	23.9
1998	82.8	24.4

Table 1.3: Percentages of People with 4 or more years of high school and college.

8. One popular theory holds that the more people who graduate from high school, the more people will graduate from college. Can you think of any reasons to suspect that this theory might be correct? If you were going to test this theory by plotting a graph, what information could you plot?

9. One option is to plot a graph of college percentage versus high school percentage. If the theory is correct, what would you expect this plot to look like? How big should the axes be to accommodate all of the data points?

10. Does the percentage of people graduating from college seem to be connected with the percentage of people graduating from high school? Explain your conclusions and give evidence to support them.

² Source: Bureau of the Census, Current Population Survey, Educational Attainment in the United States, March 1998.