

Lab #2: Understanding Functions

Calculus 1, Professor Samuels

socrates.bmcc.cuny.edu/jsamuels

please type all your answers

(except for #2,3: do them by hand on a separate sheet of paper)

- 1) what is a function?
- 2) if you were going to write down a function how would you do it? please give an example, then describe your example with one sentence.
- 3) now please write down all the different ways you can write down a function. then describe each way with one sentence and give an example.

in the following questions you are asked for a description of a graph. pretend you are talking to someone on the phone and you cannot tell them the equation. you will get full credit if someone can draw the graph from your description. (this may take a paragraph.)

- 4) graph $y = 5x + 2$
 - a) describe the graph in words.
 - b) say how the formula could help you predict the characteristics of the graph you have described.
 - c) make a numerical representation of the function
- 5) graph $y = -x^2 + 4x$
 - a) describe the graph in words
 - b) say how the formula could help you predict the characteristics of the graph you have described.
 - c) make a numerical representation of the function
- 6) graph $y = -80x + 66x^2 + 25x^3 - 12x^4 + x^5$
 - a) describe the graph in words
[note: you will have to find an appropriate viewing window to get a good display of the graph]
 - b) say how the formula could help you predict the characteristics of the graph you have described.
- 7) graph $y = 2 \cdot I^x$
 - a) describe the graph in words.
 - b) say how the formula could help you predict the characteristics of the graph you have described.
 - c) make a table of values with ten entries. include negative x-values.
- 8) graph $y = \log(x)$
 - a) describe the graph in words.
 - b) say how the formula could help you predict the characteristics of the graph you have described.
- 9) graph $y = \frac{1}{(x-1)^2} + 1$ type it as: $1/(x-1)^2+1$
 - a) describe the graph in words.
 - b) say how the formula could help you predict the characteristics of the graph you have described.
- 10) graph $y = \frac{(x-3)(x-1)}{(x-2)(x+2)}$ type it as: $((x-3)*(x-1))/((x-2)*(x+2))$
 - a) describe the graph in words.
 - b) say how the formula could help you predict the characteristics of the graph you have described.

- 11) graph $y = \frac{e^x - 1}{x}$ a) describe the graph in words.
b) make a numerical representation including $x = -3, -2, -1, 0, 1, 2, 3$ and other x -values very close to 0.
- 12) a) graph $f(x) = .5x^2$ describe the graph briefly in one sentence.
b) graph $g(x) = \sin(3x)$ describe the graph briefly in one sentence.
c) now graph $f+g$ describe the graph. explain how this graph relates to the first two graphs
- 13) a) graph $f(x) = x$ describe the graph briefly in one sentence.
b) graph $g(x) = \cos(x) + 0.8$ describe the graph briefly in one sentence.
c) extra credit: now graph fg ... describe the graph. explain how this graph relates to the first two graphs [this is one of the hardest questions here, take your time]
- 14) in #4, look at the numerical representation. what is the pattern in the y -values? [it will be easier to see if your x -values are consecutive integers, like 2,3,4]
- 15) extra credit: in #5, look at the numerical representation. what is the pattern in the y -values? [it will be easier to see if your x -values are consecutive integers, like 2,3,4]