1) Give the 32-bit value corresponding to the IEEE floating point (1 sign bit, followed by 8 bit exponent, followed by 23 bit “fraction”) for the value 2/3 in base 10. Please show your work.

2) Run your polygon area calculation program from the last assignment (or debugged version if original was buggy) on the following two polygons:

i) v1 = (.2,.2), v2 = (.1,.2), v3 = (.1,.1), v4 = (.2,.1)
ii) v1 = (9999999.2, 9999999.2), v2 = (9999999.1, 9999999.2), v3 = (9999999.1, 9999999.1), v4 = (9999999.2, 9999999.1)

a) Do you get different results? (If you get the same results for both these inputs, you will be provided with an implementation that gets different results; determine why those results differ from yours and answer the rest of this question with respect to that implementation.)

b) Which result is more accurate? Why?

c) Suggest a modification to the formula given in the last homework that will give equally accurate results for both inputs. Give the modified formula.

d) Modify your program (or the provided implementation) accordingly. Upload the revised code.

3) Debug your C-space toolpath generation algorithm implementation from HW4 if applicable. Write a function that takes the output of your HW4 function as its input, and outputs Gcode to cut the surface. Refer to the detailed instructions, Gcode skeleton, and annotated Gcode that we will send you once your HW4 code passes all of our tests.

NOTE: Feel free to discuss homework problems with other students currently taking the class, but if you do so, give them credit and describe their contribution in your write-up (and/or describe your contribution if you helped someone else). Don’t just list names; you need to describe what the contribution was. You should always work on the homework by yourself first before you discuss it, except for problems where it is specifically indicated that they are to be done with another student (none for this assignment). Keep in mind that discussion does not mean just giving someone else an answer — that doesn’t help anyone learn anything.

You must always do your own coding and your own write-ups! Do not share copies of any code or allow someone else to look at your code or write-ups for any reason. Do not copy or consult anyone else’s code or anyone else’s write-up. You also must not consult anyone not in the class (except the professor or GSI of course), or consult any references besides those provided in the class or general math or programming references, for help on the homework. Please ask me if you have questions about what is or is not allowed. Copying, allowing someone to copy, or getting outside help could result in a score of zero on an assignment.