**Please read the scenario below and respond to questions in your submission.**

Black Ice Manufacturing makes wooden cabinets for high-end audio speakers that are finished in a high-gloss black paint. Because of the premium charged for such speakers, customers expect the finish on such speakers to be near flawless. Over the years, Black Ice has perfected the finish painting process and has established itself as a reliable supplier of high-gloss cabinets. Recently some customers have been complaining about the paint finish. Mary Snow, the manufacturing manager of Black Ice, has been tasked with investigating the problem.

Mary first reviews the quality control procedures and learns that each speaker is inspected to look for “visible” blemishes (defined as blemishes of size larger than 0.5 mm). Speakers with one or more visible blemishes were rejected as being defective. Based on her conversations with the quality department, Mary is assured that there has not been any change in process settings or quality control standards. Mary is concerned that the standard for “visible” blemishes may be inappropriate and the reason for the problem. In particular, she suspects that smaller blemishes may not be individually visible, but a large number of smaller blemishes may cause customers to feel that the finish is of poor quality. Mary has asked the quality control department to investigate the problem further. She asks for random samples to be collected every hour during two eight-hour shifts, and for every sampled cabinet be inspected under magnification and any blemish larger than 0.1 mm be noted. The quality control department collected 10 samples every hour and recorded the number of blemishes larger than 0.1 mm on each sampled cabinet. The data from the 160 cabinets (10 samples/hour X 16 hours) is given in the file attached below. For each sample the file shows the number of “visible” blemishes (larger than 0.5mm) and the number of blemishes between 0.1mm and 0.5mm observed under magnification.

**Based on this information and the data given, please answer Question 1 through 4 below.**

**Question 1:**Mary Snow has asked you to look at the collected data and determine which data to use and what type of chart would be appropriate in this case. Briefly justify your answer. (3 points)

**Question 2:**If a C-chart is used to analyze the blemishes between 0.1 and 0.5mm, calculate the center line, and the lower and upper control limits. (You do not have to draw the control chart) (3 points)

**Question 3:**Interpret the data by comparing the sample data you used with your calculated control limits (2 points)

**Question 4:**Does the data and your analysis above, support Mary Snow’s belief that customer complaints are the result of many smaller blemishes. (2 points)