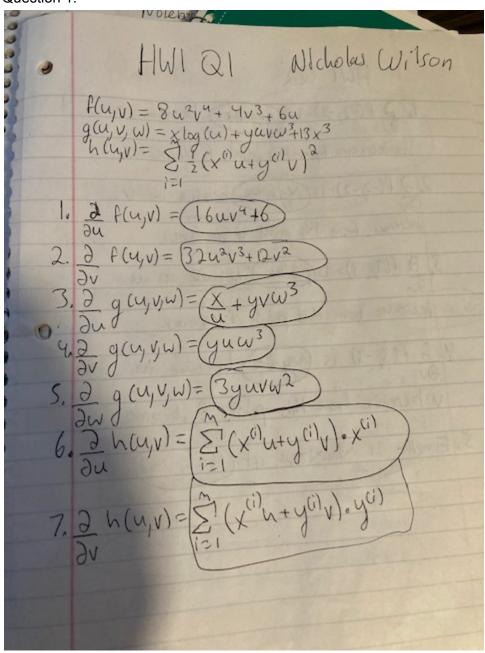
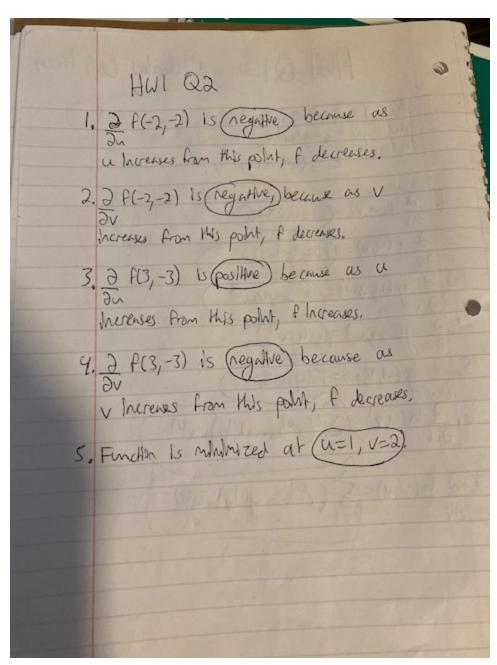
Nicholas Wilson nbwilson 931044347

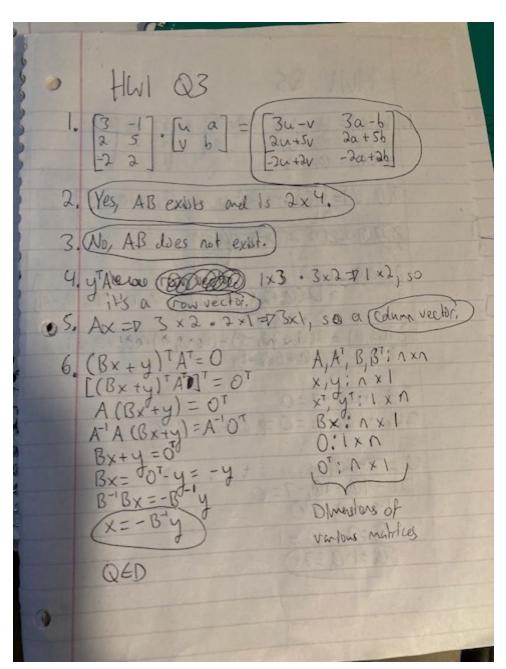
Below are my answers to parts 1, 2, and 3 for homework 1, as well as to question 1 of part 5. Code is in gd.py and excercise_1.ipynb. This also includes my answer to the optional question in part 6 (why don't you normalize the column of all 1's in X?). Question 1:



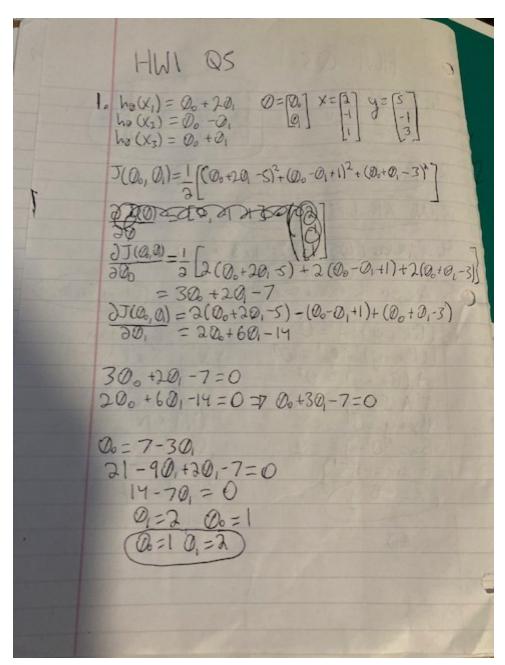
Question 2:



Question 3:



Question 5:



Question 6 optional:

You don't normalize the column of 1's in X because that column is only there to serve as a placeholder so you can matrix multiply with theta and get the offset of theta_zero. Changing those 1's to anything else would stop that. Furthermore, the mean is obviously one, and if you subtracted that from the column, you'd get a column of zeros which would remove the offset. Standard deviation is also zero, so you'd get an error if you tried to divide it by its standard deviation.