**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Business Analytics: Take Home Final Exam Problems**

You may work together and share answers on problem 1). **Do problem 2) completely on your own, no discussion, good luck!**

1. a) Huggins Industries is headquartered here in Durango {81301}, but the company has distributors all over the US. The CEO visits these locations regularly in his Gulfstream G650 and wants to know the distance between each pair of cities. Set up a 6x6 table and determine the pair-wise distances between Durango, CO; Missoula, MT; Olympia, WA; Claremont, CA; Ann Arbor, MI; and Honolulu, HI. **Include this table.**

b) Occasionally, inventories become unbalanced at the six locations above. This is currently the case where Durango has 10000 units, Missoula has 2000, Olympia has 5000, Claremont has 12000, Ann Arbor has 7000 and Honolulu has none. Assume that you may transship products from one location to another, and the cost per product is $0.001 per mile. What is the cheapest way to transship products amongst the six locations to balance the inventories at all of them? **What is the minimum cost and describe how much should be shipped to and from each location.**

1. Assume the graph below has price on the x-axis and profit on the y-axis. It’s clear from the picture that profit is maximized at y ≈ 107 when x ≈ 70. But what is the function for this curve? Determine the best fitting curve that you can for this graph **and explain how you approached solving this one.** Your final answer will be a function y = f(x) and an included graph of what your function looks like between x = 0 and x = 200. Your score on this problem will depend on your explanation and the r2 value between your function and the actual function used to draw it. [Hint: The original function contained just two terms. It’s OK if your best fit has more (or less) though.]

