Name: _____

MATH 108
Spring 2023
HW 2: Due 02/06

"There is only one boss. The customer. And he can fire everybody in the company from the chairman on down, simply by spending his money somewhere else."

–Sam Walton

Problem 1. (10pt) Suppose that the revenue and cost function for a certain item are given by $R(q) = 199.99q$ and $C(q) = 56.24q + 1260000$, respectively.

(a) How much does the company sell each item for? How much does it cost to make each item?

(b) What are the fixed costs for the production of this good?

(c) What is the profit or loss if the company produces and sells five-thousand of these items?

(d) What is the break-even point? At least many items does this company need to sell in order to make a profit on this item?

Problem 2. (10pt) Bread Pitt is a bread and pastry shop. They make an exquisite challah bread that is a talk of the town and sells for only $7.49. The cost to make each loaf is approximately $0.89. However, between the utilities and various other costs, the shop pays at least $847 per day just to stay open.

(a) What are the fixed and variable costs for producing this bread?

(b) Find the cost function for this bread.

(c) Find the revenue function for this bread.

(d) Find the break-even point for producing this challah bread.

Problem 3. (10pt) Suppose a company produces two items, q_1 and q_2, and has a cost function given by $C(q_1, q_2) = 746.12q_1 + 646.95q_2 + 846221$.

(a) What are the fixed costs for producing these two items?

(b) What is the total cost associated with producing 20 of the first item and 25 of the second item?

(c) How much does it cost to produce the first item? How much does it cost to produce the second item?

Problem 4. (10pt) Suppose that you have a revenue function given by $R(q) = 20q$ and a cost function given by $C(q) = 5q + 160$.

(a) Without finding the profit function, find the break-even point for the production/sale of this item.

(b) Sketch the revenue and cost function on the plot below.

(c) Without finding the profit function, explain using (b) where the profit function will cross the q-axis.

(d) Find the profit function and show that it has the q-intercept you found in (c).