

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 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).

