Name: _____
MATH 100
Fall 2023
HW 10: Due 10/30

"The superior man understands what is right; the inferior man understands what will sell."

– Confucius

Problem 1. (10pt) Lee H. is taking out a loan to help expand his liquor store *Tequila Mockingbird*. Lee decides to borrow $60,000 at 12.6% annual interest, compounded monthly. The loan will be repaid with equal end of the month payments over a period of 3 years.

(a) What will Lee's monthly payment be?

(b) How much does Lee pay in total for this loan?

(c) How much does Lee pay in interest for this loan?

Problem 2. (10pt) A product has cost function $C(q) = 12.67q + 16200$ and revenue function $R(q) = 29.99q$.

(a) What are the fixed costs?

(b) How much does it cost to produce each product? How much does each product sell for?

(c) Find the break-even point.

(d) What is the minimum number of items that must be made/sold in order to make a profit?

Problem 3. (10pt) You rent a small studio apartment in NYC for $3,380 per month to produce social media content. Between hiring actors, purchasing props, travel costs, etc., it costs approximately $510 to produce a video. However, each video typically makes $870 in ad revenue and sponsorship deals. Let $C(v)$ and $R(v)$ denote the cost and revenue function to produce v videos.

(a) Explain why $C(v)$ and $R(v)$ are approximately linear.

(b) Find $C(v)$ and $R(v)$.

(c) What is the minimum number of videos you have to produce to make a profit each month?