Name: _____
MATH 100
Fall 2022
HW 6: Due 10/03

"If you fish can catch nothing, you have still caught a lesson."
–Matshona Dhliwayo

Problem 1. (10pt) You are standing at the corner of 6th and 40th while your friend is standing at the corner of 2nd and 59th.

(a) How many blocks are you from your friend?

(b) How many blocks are you from your friend 'as the crow flies'?

(c) What is your Euclidean distance between you and your friend?

(d) What is your Manhattan distance between you and your friend?

Problem 2. (10pt) You see a plane at cruising altitude (approximately 38,000 ft) flying over a nearby airport. You know that the airport is 8.5 mi away. How far is the plane from you at this moment? [5,280 ft $=$ 1 mi]

Problem 3. (10pt) Suppose you are designing a custom fish tank. The fish tank will be a rectangular box will be 36 in x 18 in x 19 in. The top will be open so that the tank can be accessed.

(a) If you have to cover the exposed sides with a special plastic coating, what is the area of plastic coating that is needed per tank?

(b) How much water, in gallons, can the tank hold? [1 $ft^3 = 7.48052$ gallon]

(c) Suppose you are going to put a volcano in the tank, which will have the shape of a right circular cone. If you put the largest possible volcano in the tank, how much water will it then take to fill the tank?

Problem 4. (10pt) Suppose a courtyard at some hedge fund is approximately elliptical in shape. It is approximately 50 ft 'the long way' and 35 ft 'the short way.'

(a) What is the area of the courtyard?

(b) If someone can push mow approximately 320 square foot of lawn per minute, how long does it take to mow the courtyard?

(c) If every 1,000 square foot has to be fertilized with 10 lbs of fertilizer and the fertilizer costs $2.08 per pound, how much does it cost to fertilize the courtyard?