

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? [ $1 \text{ ft}^3 = 7.48052 \text{ gallon}$ ]
- (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?