Name: _____
MATH 108
Spring 2024
HW 12: Due 03/18

"Society is never gonna make any progress until we all learn to pretend to like each other."

— Turanga Leela, Futurama

Problem 1. (10pts) A company is examining their sales history across the past few decades. Thirty years ago, the company's yearly sales were normally distributed with mean \$12.4 million with standard deviation \$2.7 million. In that decade, the company experienced a year where they only had \$3.1 million in sales. A decade ago, the company's sales were normally distributed with mean \$45.0 million and standard deviation \$8.6 million. During that decade, the company had a year where they had \$73.1 million in sales. Which was more unusual, their sales slump about 30 years ago or their sales boom about 10 years ago? Explain.

Problem 2. (10pts) A local municipality is trying to determine how to allocate state and federal funds to local parks. Looking at historical data, they find that one of their local beaches has a summer visitor guest total that is normally distributed with mean 43,360 and standard deviation 4,271.

(a) What is the probability that the beach will see between 38,000 and 50,000 visitors this summer?

(b) What is the probability that the beach will see less than 35,000 visitors this summer?

(c) What is the probability that the beach will see more than 50,000 visitors this summer?

Problem 3. (10pts) Government workers are examining smartphone usage in teenagers. They survey parents across the 50 states about their children's phone usage. The survey finds that the reported daily hours of smartphone use by teens is approximately normally distributed with mean four hours and standard deviation 2.1 hours.

(a) What percentage of teenagers use their phone more than 6 hours per day.

(b) At least how long do the top 10% of daily teenage smartphone users spend on their phone each day?