

Name: _____

MATH 108

Spring 2024

HW 13: Due 03/25

“That’s the thing. I don’t think I believe in deep down. I kinda think that all you are is just the things that you do.”

— Diane Nguyen, BoJack Horseman

Problem 1. (10pts) Psychologists are examining how students cope with failure. They find estimates that 20% of individuals will fail at least one course during their lifetime. Suppose that you take a simple random sample of nine students.

- (a) What is the probability that exactly 4 of them have failed a course?
- (b) What is the probability that at least one of them has failed a course?
- (c) What is the probability that less than 5 of them failed a course?
- (d) What is the probability that exactly 8 of them failed a course?

Problem 2. (10pts) A state senate race has grown increasingly tense as scandal has struck the incumbent's office, resulting in a huge drop in their support. It is currently estimated that only 10% of voters currently support the incumbent. Suppose pollsters take a simple random sample of 15 potential voters.

- (a) What is the probability that more than 8 of them support the incumbent?
- (b) What is the probability that less than 4 of them support the incumbent?
- (c) What is the probability that at least one of them support the incumbent?