

# STAT 2290 Homework 3

Hand in on March 11 or March 12 before Exam 2.

## Read these instructions:

Show your work. Answers without proper justifications receive no credit.

### Problem 1.

In dry weather, the probability of a bus being late is  $1/10$ .

In rainy weather, the probability of a bus being late is  $1/4$ .

In snowy weather, the probability of a bus being late is  $2/3$ .

The probability of dry weather is  $3/4$ .

The probability of wet weather is  $1/5$ .

The probability of snow is  $1/20$ .

(a) Show this information on a tree diagram.

(b) Find the probability that the weather is dry and the bus is on time.

(c) Find the probability that the bus is late.

### Problem 2.

Every 4th GPU manufactured is tested. The test consists of running four independent tasks and checking the results. Failure rates for the four tasks are, respectively, 0.01, 0.03, 0.02, and 0.01.

(a) Find the probability that a GPU was tested.

(b) Find the probability that a GPU was tested AND failed some test.

(c) Given that a GPU was tested, what is the probability that it failed tasks 2 or 3?

(d) In a sample of 100, how many GPUs would you expect to be rejected?

### Problem 3.

A fair dice is tossed 3 times. Find the probability of getting exactly two 1's. (Hint: view dice as an unfair coin: "heads" = get 1, "tails" = get 2-6.)

### Problem 4.

Three friends in Seattle each told you it is rainy, and each person has a  $1/3$  probability of lying. What is the probability that Seattle is raining, assuming that the likelihood of rain on any given day is 0.25?

## Answers.

1. (b) 0.675; (c) 0.1583

2. (a) 0.25; (b) 0.0171; (c) 0.0494;

(d) 1.7 or 2 after rounding.

3. 0.0694

4.  $8/11$