Midterm Quizzes

Chapter 1

Clara is an interstellar traveler with a weird spaceship that looks like a blue box. She decides to visit all 7 stars in the Big Dipper (suppose there's only 7 stars) in a week, visiting one star each day. How many ways can she plan her journey?

Chapter 2

Timmie raises ducks and pigeons in his backyard. He has 7 ducks and 10 pigeons.

Today he randomly picks 5 fowls from his backyard. What's the probability that all 5 are ducks?

Chapter 3

A TV show I watched is sponsored by a beverage brand. During commercial breaks, there's always advertisements of the drink with actors from the show. I want to know if the commercials are really effective, so I randomly surveyed some people. I found that 30% of them have watched the show, and 50% of people who watched bought products from the brand. Also, for those people who didn't watch, 10% of them bought products from the brand. (Data made up by me)

Suppose the sample group is representative of the whole population. What's the probability that a person has watched the show given that the person bought from the brand?

Chapter 4

Many popular video games (like [Genshin Impact](#)) has a "gacha" system, which allows players to exchange in-game currency for a random item in game, including characters, weapons, cards, etc. Each exchange is called a "roll".

Andy is playing such a game, and there's a character that he really wants. It's said in the game that the probability of getting this character is 0.01, and he still wants to try his luck. Andy decides that he'll continue rolling until he gets the character. What's the probability that he makes 100 rolls?