Key

1. A bowl contains 60 pieces of Reese's Pieces candy. The probability of picking a brown piece is ¼. The probability of picking a yellow piece is ⅓.

   a. What is the probability of picking an orange piece?

   $P(Brown) = \frac{1}{4} = \frac{3}{12}$

   $P(Yellow) = \frac{1}{3} = \frac{4}{12}$

   $P(orange) = \frac{12}{12} - \frac{3}{12} - \frac{4}{12} = \boxed{\frac{5}{12}}$

   b. How many of each are in the bowl?

   Brown: $\frac{3}{12} = \frac{15}{60}$ 15 brown

   yellow: $\frac{4}{12} = \frac{20}{60}$ 20 yellow

   orange: $\frac{5}{12} = \frac{25}{60}$ 25 orange

2. After eating some of the candy, the bowl now contains 5 yellow pieces, 7 orange pieces, and 8 brown pieces. Wanting to savor every last piece, you reach in and take out a single piece at random. $5 + 7 + 8 = 20$

   a. What is the probability the piece is orange?

   $P(orange) = \boxed{\frac{7}{20}}$

   b. How many brown pieces do you need to eat so that the probability of picking brown is ¼?

   Right now, the probability of brown = $\frac{8}{20}$. Every time one is removed, the number of brown pieces AND the total amount is reduced by 1.

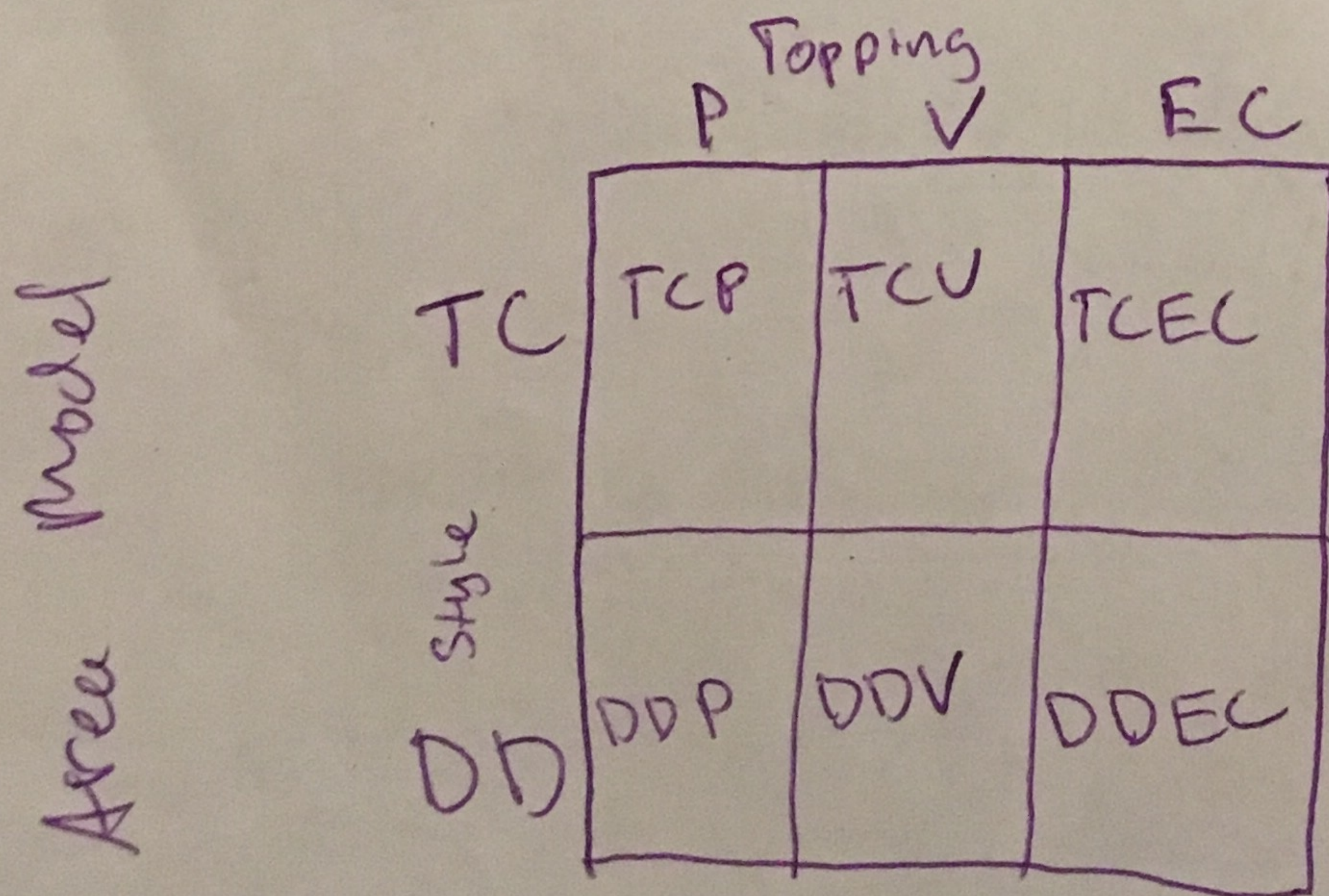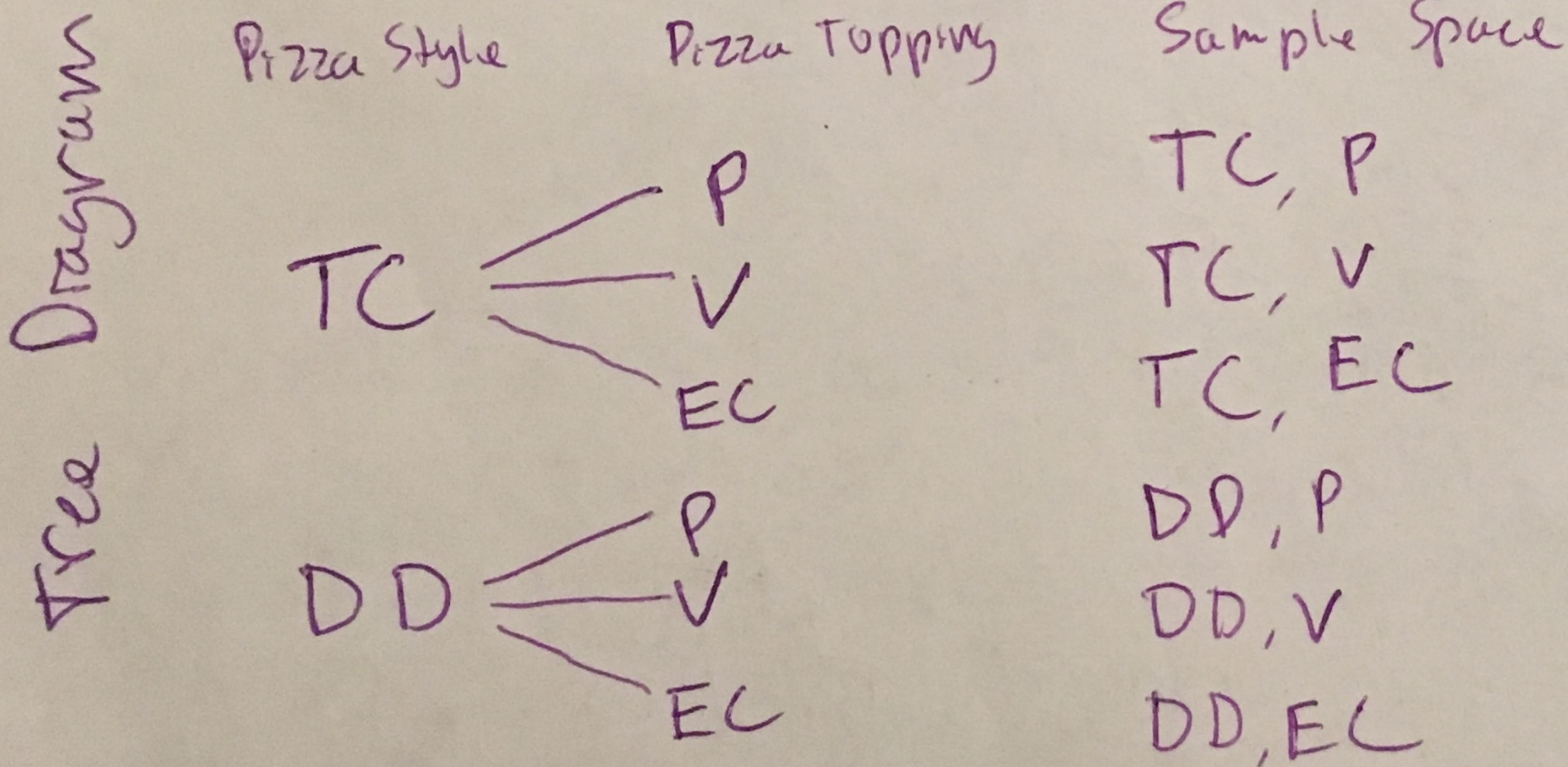 | Brown left | 8 | 7 | 6 | 5 | ④ |
   |---|---|---|---|---|---|
   | Total Pieces | 20 | 19 | 18 | 17 | ⑯ |

   $\frac{4}{16} = \frac{1}{4}$ (4 brown Pieces)

3. A pizza parlor offers two types of pizzas with three types of toppings.

Pizza Style	Pizza Topping
Thin Crust	Pepperoni
Deep Dish	Veggie
	Extra Cheese

TC — Thin Crust
DD — Deep Dish
P — Pepperoni
V — Veggie
EC — Extra Cheese

a. Create a tree diagram or area model to display all of the possible outcomes.

Tree Diagram

Pizza Style	Pizza Topping	Sample Space
TC	P	TC, P
	V	TC, V
	EC	TC, EC
DD	P	DD, P
	V	DD, V
	EC	DD, EC

Area Model

Topping

Style	P	V	EC
TC	TCP	TCV	TCEC
DD	DDP	DDV	DDEC

4. Suppose you select a pizza at random...

a. What is the theoretical probability of getting a deep dish pizza?

$$P(DD) = \frac{3}{6} = \frac{1}{2}$$

b. What is the theoretical probability of getting a thin crust veggie pizza?

$$P(TCV) = \frac{1}{6}$$

c. What is the probability of getting a veggie OR extra cheese pizza?

$$P(V \text{ or } EC) = \frac{4}{6} = \frac{2}{3}$$

5. The following two spinners are used in a game. To play the game, you spin both spinners. If the sum of the numbers on both spinners is odd you win. If the sum is even, you lose. Draw a tree diagram or area model to represent this situation (remember, it may be helpful to split the spinner into equal sections first!)

1

2

3
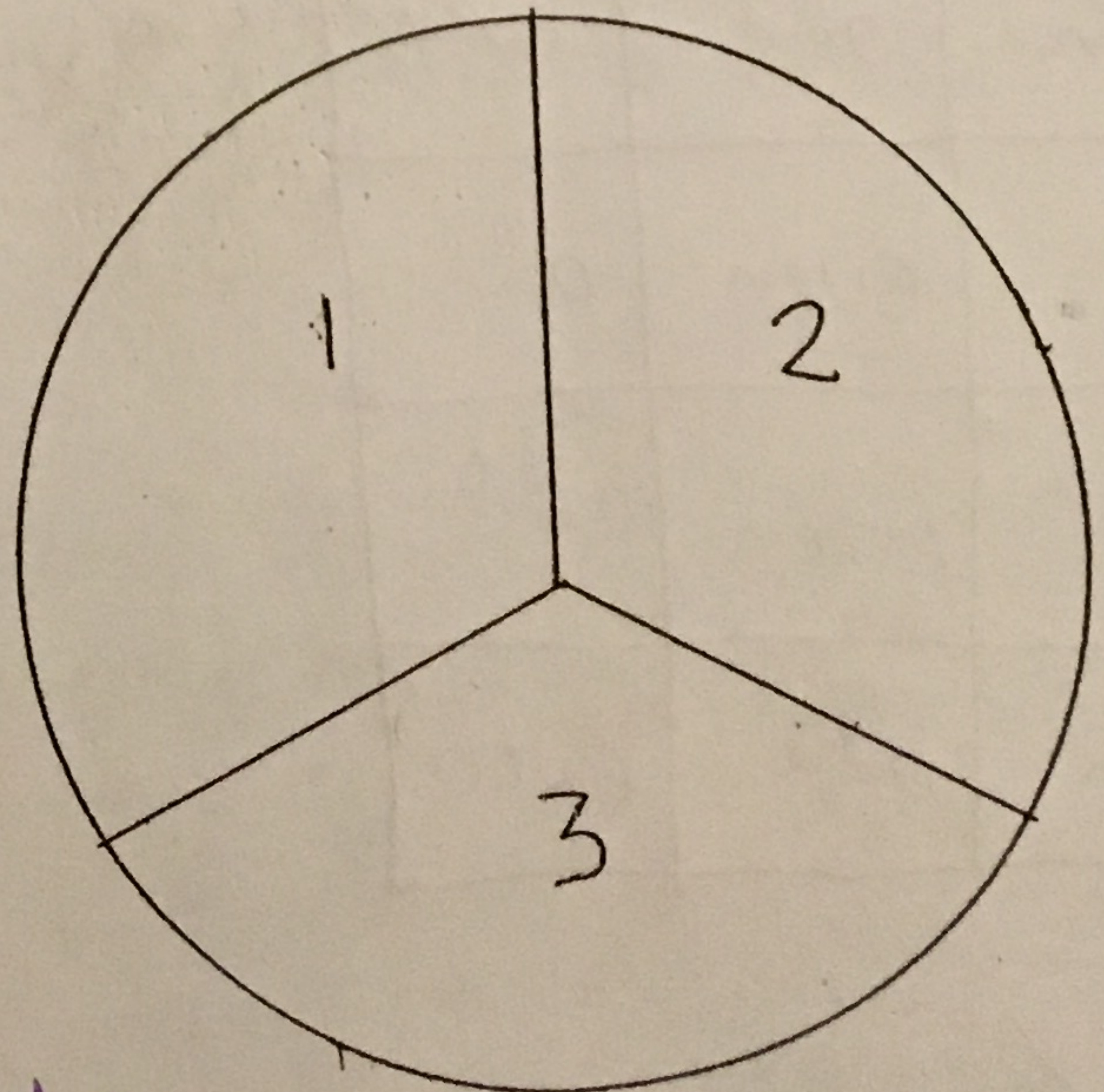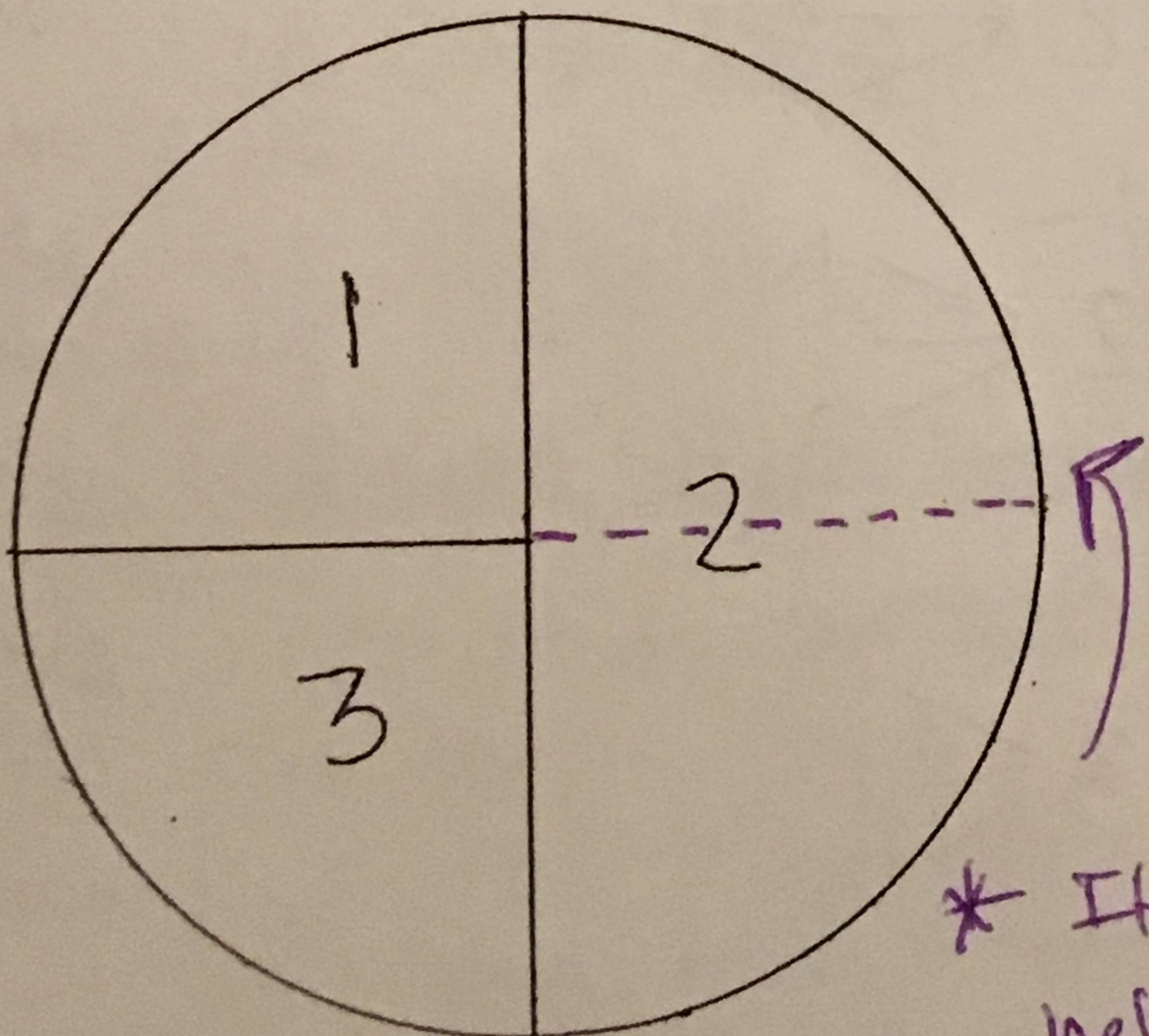
★ Its helpful to divide into equal sized Sections

a. What is the probability of winning this game?

$$P(win) = \frac{6}{12} = \frac{1}{2}$$

b. What is the probability of losing this game?

$$P(lose) = \frac{6}{12} = \frac{1}{2}$$

c. Is this a fair game? yes, because the chances of winning and losing are equally likely.
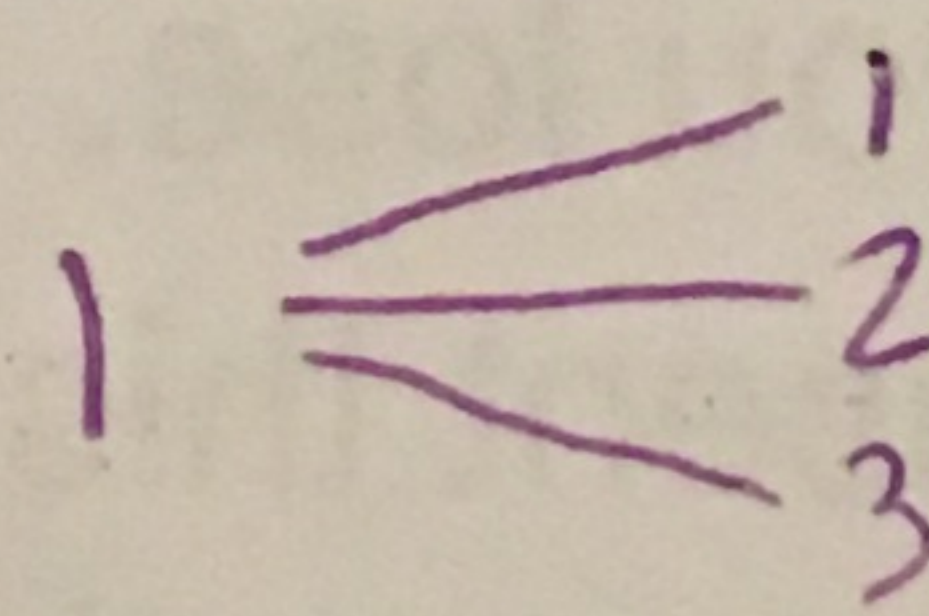
Area model

Spinner 2

	1	2	3
1	even	odd	even
2	odd	even	odd
2	odd	even	odd
3	even	odd	even

Spinner 1

Spinner 1

$$1 \begin{cases} 1 \\ 2 \\ 3 \end{cases}$$

$$2 \begin{cases} 1 \\ 2 \\ 3 \end{cases}$$

$$2 \begin{cases} 1 \\ 2 \\ 3 \end{cases}$$

$$3 \begin{cases} 1 \\ 2 \\ 3 \end{cases}$$
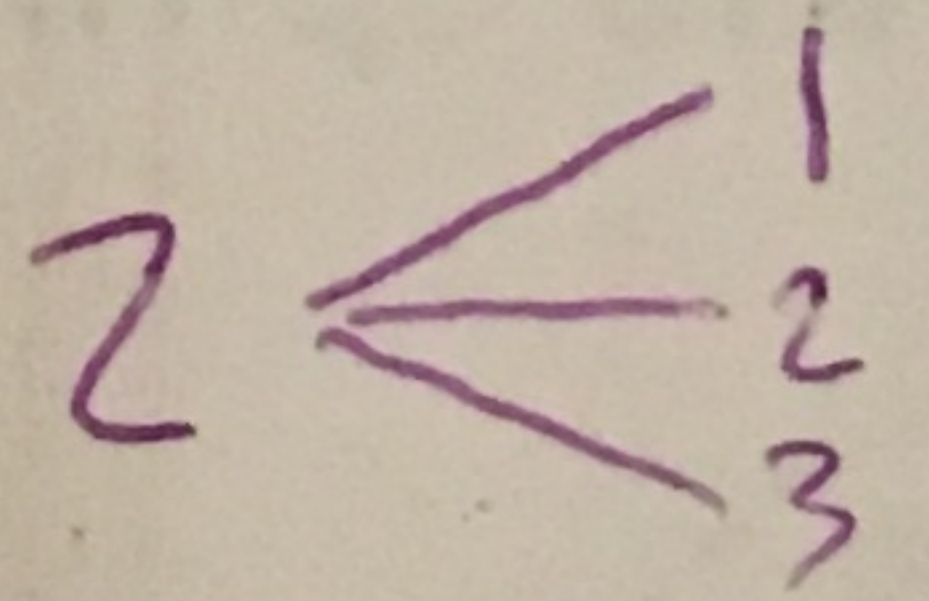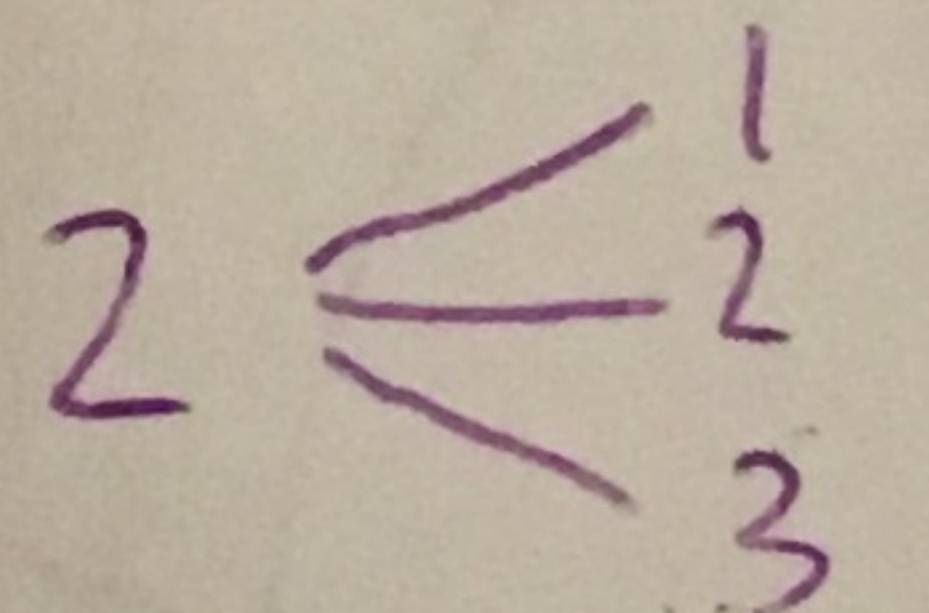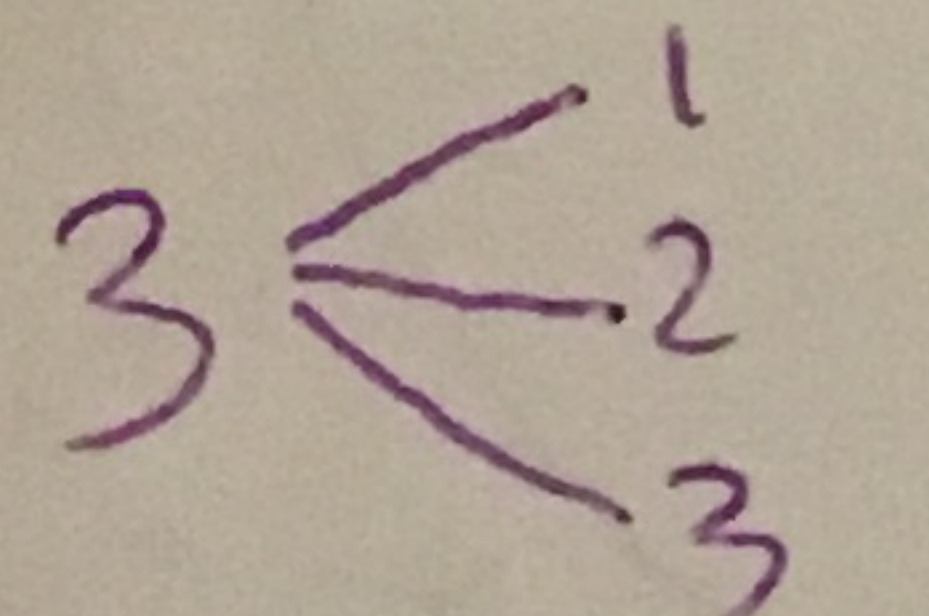
Spinner 2

Sample Space

1+1 even
1+2 odd
1+3 even

2+1 odd
2+2 even
2+3 odd

2+1 odd
2+2 even
2+3 odd

3+1 even
3+2 odd
3+3 even