

Problem Set #1

Wednesday, August 31, 2022

2:02 PM

1. Using the rules from our Liar's Dice game:

- a. If you have two dice left and your opponent also has two (unknown) dice left, what is the probability that at least one of the opponent's dice is a 4?

Chance that at least 1 of the 2 dice opponent has is a 4, also just 1 minus chance that both are not 4.

Chance that both are not 4:

$$\frac{5}{6} * \frac{5}{6} = \frac{25}{36}$$
$$1 - \frac{25}{36} = \frac{11}{36}$$

- b. If you have two 2s, what is the probability of seeing exactly 3 twos (in total) if your opponents have three (unknown) die?

Find chance that opponent has exactly 1 two out of 3 dice.

Adding the chance of first being 2 and others being not 2, second being 2 and others not being 2, and third being 2 and others not being 2

$$\frac{1}{6} * \frac{5}{6} * \frac{5}{6} + \frac{5}{6} * \frac{1}{6} * \frac{5}{6} + \frac{5}{6} * \frac{5}{6} * \frac{1}{6} = \frac{25}{216} + \frac{25}{216} + \frac{25}{216} = \frac{75}{216} = \frac{25}{72}$$

OR

$$3 * \frac{1}{6} * \frac{5}{6} * \frac{5}{6} = \frac{25}{72}$$

- c. Make up and answer your own question about probability for a scenario of your choosing: If your opponent has 3 unknown die, what is the chance that at least 2 of them are of the same value?

1 minus the chance that none of the 3 are the same

$$\frac{5}{6} * \frac{4}{6} * \frac{3}{6} = \frac{20}{36} = \frac{5}{9}$$
$$1 - \frac{5}{9} = \frac{4}{9}$$