Name_____   *Statistics Chapter 12: Reading Guide*

Below are statements taken from this chapter. Some have been changed to be false statements. Identify whether the statement is always true or not. If not always true, correct the statement to be always true.

over time

1. Truly random phenomena do ~~n~~x̄t settle down in a way that is consistent and predictable.   *LLN*

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T   2. As data was collected on the traffic light each day, the overall percentage of time the light was green settled in on a specific value.   *LLN*

Averages

F   3. The Law of ~~Large Numbers~~ helps predict short-run behavior of random phenomenon.
                    (but L of A is false)

T   4. Random events do not compensate in the short run to get back to the right long-run probability.

False

F   5. The Law of Averages is a tr~~u~~x̄e law that predicts the outcome after a streak of unexpected outcomes.

T   6. The probability of an event is the number of equally likely outcomes in the event divided by the total number of equally likely outcomes.

False   *some*
7. ~~Random~~ events are all equally likely.   **Ex:** Roll 2 dice
                                                              $P(7) \neq P(12)$

T   8. If event *A* has *m* outcomes and event *B* has *n* different outcomes, then the number of outcomes in event A **or** B is *m + n*.

T   9. If event *A* has *m* outcomes and event *B* has *n* outcomes, then the number of outcomes in event A **and** B is *mn*.

T   10. When deciding whether to use permutations or combinations, one should decide whether the *order* in which things happen is important.

12-9

What's the probability of winning the daily Take Five Lottery? You must match 5 numbers (1-39). PG 48

$$P(5\ \text{Winning}\ \#5) = \frac{_5C_5}{_{39}C_5} = \frac{1}{575,757}$$

Probability of Winning 1st Prize = 1/575,757

Prize varies but approx. $70,000

Probability of winning the Mega Millions Lottery?

To win the Jackpot, you must match five numbers (1-70) and the Mega ball (1-25).

$$\frac{_5C_5 \times _1C_1}{_{70}C_5 \times _{25}C_1} = \frac{1}{302,575,350}$$

Probability of Jackpot = 1/302,575,350

~~Class~~ ~~Home~~work: Watch out for if ORDER matters. P549

1. You randomly choose 2 spices off a spice rack to complete your chili recipe. There are 20 spices on the rack. What is the probability that both spices are cumin, red pepper, cinnamon, celery seed, and thyme (all of which were on the rack)?

$$P(2 \text{ from the } 5) = \frac{_5C_2}{_{20}C_2} = \frac{10}{190}$$

2. ~~The five Smith children run to an ice cream truck.If the five children are served randomly, how likely is it that the two oldest children are served before the three youngest?~~

3. Shaun orders a triple scoop cone with three different flavors of ice cream. There are 31 flavors to choose from. If Shaun closes his eyes and randomly picks three flavors from a list, what is the probability that Shaun's triple scoops cone will contain his two favorite flavors? <u>Hint:</u> His cone must have three flavors, 2 are his favorite two, and the third scoop is one of the remaining 29 flavors.

$$P(2 \text{ Fav } \underline{and} \text{ 1 other}) = \frac{_2C_2 \times _{29}C_1}{_{31}C_3} = \frac{29}{4495}$$

4. ~~The local Mal-mart store just received a shipment of 12 different bikes. From these, they will select 5 bikes to put on display in a line in front of the store. 9 of the 12 bikes are motocross style. How likely is it that exactly the first 3 bikes in the bike lineup are motocross style?~~

5. While helping out in your little brother's elementary classroom, the teacher asks you to take 3 students to the library. There are 24 students in the class. You randomly choose names from a jar. What is the probability that your brother will be one of the three people to get picked?

$$P(1 \text{ Brother and 2 others}) = \frac{_1C_1 \times _{23}C_2}{_{24}C_3}$$

$$= \frac{253}{2024}$$

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Classwork/Homework:

Pg. 304 - 308 #1 - 5, 8, ~~10~~, 15