M7 Unit 10 Review: Probability Name:_____

**Describe the likelihood of an event as impossible, unlikely, equally likely, likely or certain.**

1. Your football team wins $\frac{1}{5}$ of the time. Unlikely
2. There is a 90% chance that you pass this test. Likely
3. The probability that the sun rises in the west tomorrow is 0. Impossible!
4. Picking an even number from a jar with papers labeled from 1 to 5. Unlikely

**Find each theoretical probability as a FRACTION in SIMPLEST FORM, if you roll a standard number cube.**

5. P (not 2) = $\frac{5}{6}$
6. P (5 or 6) = $\frac{2}{6} = \frac{1}{3}$
7. P(8) = 0

**Suppose a number cube is rolled 220 times. About how many times should each event occur?**

8. A 4 is rolled.

$\frac{4\text{s}}{\text{TOTAL}} \quad \frac{1}{6} = \frac{x}{220} \quad 6x = 220 \quad x = \frac{220}{6} = 36.7$

About 37 times

9. An even number is rolled.

$\frac{\text{EVEN}}{\text{TOTAL}} \quad \frac{3}{6} = \frac{x}{220} \quad \frac{6x}{6} = \frac{1320}{6} \quad x = 110 \text{ times}$

**After the number cube was rolled, the following outcomes were recorded:**

| | # of flips |
|---|---|
| **Heads** | 16 |
| **Tails** | 18 |

Find the **experimental probability** of each event based off of the flipping of a coin recorded in the table. Write your answers as ***fractions*** in lowest terms.

10. P (Tails) = $\frac{18}{34} = \frac{9}{17}$
11. P(Two Tails if flipped twice) = $\frac{81}{289}$

$\frac{9}{17} \cdot \frac{9}{17} = \frac{81}{289}$

**A bag of marbles contains: 12 green, 1 blue, 2 yellow, and 1 purple. Find each probability as a DECIMAL.**

12. P (green) = $\frac{12}{15} = 0.8$
13. P (green or blue) = $\frac{13}{15} = 0.87$

**Tell whether the events are INDEPENDENT or DEPENDENT.**

14. You roll a number cube twice. You get a 4 an a 1. **INDEPENDENT** or ~~DEPENDENT~~
15. You toss a coin. If it is heads, you toss it again. If it is tails, you quit. ~~INDEPENDENT~~ or **DEPENDENT**

**A bag holds 3 green, 2 blue, and 5 magenta pens. You select a pen randomly.**

**Use the above information to answer the following WITHOUT replacement.**

16. Find P (green, green)

$\left(\frac{3}{10}\right)\left(\frac{2}{9}\right) = \frac{6}{90} = \frac{1}{15}$

17. 31. Find P (magenta, green)

$\left(\frac{5}{10}\right)\left(\frac{3}{9}\right) = \frac{15}{90} = \frac{1}{6}$

**Use the above information to answer the following WITH replacement.**

18. Find P (green, green)

$\left(\frac{3}{10}\right)\left(\frac{3}{10}\right) = \frac{9}{100}$

19. 31. Find P (magenta, green)

$\left(\frac{5}{10}\right)\left(\frac{3}{10}\right) = \frac{15}{100} = \frac{3}{20}$

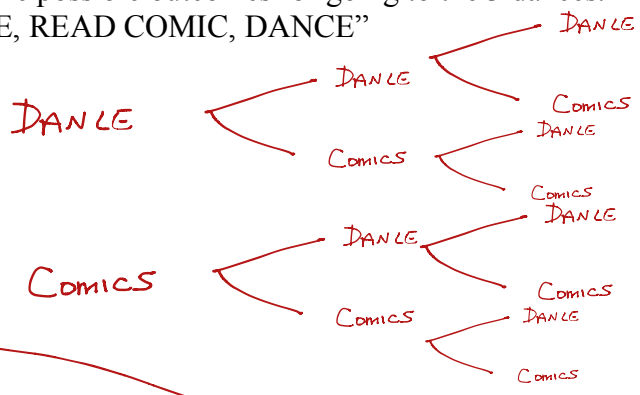
20. The Cleveland Browns win 9 out of 16 games played. How many games will they win out of 100 games?

WINS / TOTAL $\quad \frac{9}{16} = \frac{x}{100} \quad 16x = 900 \quad x = 5.625$ ABOUT 6 games

**In middle school, Brust would go to a school dance and "Brust a Move" (dance) 50% of the time. The other 50% of the time he would stay home and read comic books. Suppose Brust's school had 3 dances one year.**

21. Make a tree diagram to show all of the possible outcomes for going to the 3 dances. Then, list each outcome lie "DANCE, READ COMIC, DANCE"

Tree Diagram:




Outcomes: DDD, DDC, DCD, DCC
CDD, CDC, CCD, CCC

41. What is the theoretical probability that Brust goes to all three dances?

$P(3\ \text{DANCES}) = \frac{1}{8}$

Sully wants to know if he will see Mr. Brust at the dances. He simulates the outcome of the three dances using a coin. A heads represents "Brust a Move!" and a tails represents "Reads Comics". Sully records the results here:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Simulation #1: | HTH | Simulation #2: | THT | Simulation #3: | HHH | | |
| Simulation #4: | TTH | Simulation #5: | THH | Simulation #6: | THH | | |
| Simulation #7: | HTT | Simulation #8: | TTT | Simulation #9: | HTT | Simulation #10: | THT |

43. According to simulation #8, how many dances did Brust attend? ZERO

44. According to the simulations, what is the ***experimental probability*** that Brust attends all 3 dances?

$P(3\ \text{DANCES}) = \frac{1}{10}$