

NAME: Key

MATH-7 NOTES

DATE: ___/___/___

What: **PROBABILITY OF COMPOUND, DEPENDENT EVENTS**



Why: To calculate the probability of compound, dependent events.

VOCABULARY:


Two events are independent when the outcome of one event does NOT affect the outcome of the other event.

Two events are dependent when the outcome of one event DEPENDS on the outcome of the other. In other words, the first event affects the outcome of the second event.

Scenario	Dependent or Independent?
1. Out of a bag of 20 marbles, calculating the probability of picking a red marble, setting it aside, and picking a green marble.	D
2. When flipping a coin and rolling a die, calculating the probability of getting heads and a 4.	I
3. Out of a bucket of tootsie pops, calculating the probability of picking a cherry, putting it back in the bucket, and then picking an orange.	I
4. When flipping three coins at once, calculating the probability of getting three heads in a row.	I
5. From a standard deck of cards, calculating the probability of picking a red Queen, keeping it, and then picking a black Jack.	D
6. From a standard deck of cards, calculating the probability of picking a diamond, replacing the card, and picking the six of hearts.	I

TRIAL WITHOUT REPLACEMENT . . .

What if we did a Tootsie Pop pick, but did not put the tootsie pops back in the bucket??

TRIAL #1: Tootsie Pop Double-Pick	
Out of 20 "two-pick" trials, how many times will a grape AND a cherry get picked? The first pop will NOT be replaced. $P(\text{grape and cherry})$	
1) What do we need to know? # of grape <u>2</u> # of cherry <u>5</u> total # of pops: <u>25</u>	2) Theoretical Probability: (what <i>should</i> happen) $\frac{2}{25} \cdot \frac{5}{24} = \frac{10}{600}$ or $\frac{1}{60}$
3) Do the experiment (20 trials): 	4) Experimental Probability: (what <i>actually</i> happened)

EXAMPLES:

- 1) What if we tried to pick two grapes in a row – without replacing the first grape (using the above numbers for our tootsie pop bucket)??

$$\frac{2}{25} \cdot \frac{1}{24} = \frac{2}{600} \text{ or } \frac{1}{300}$$

- 2) Without replacing any letters, Jane will pick two letters from a bag containing the following choices:

M-A-T-H-I-S-C-O-O-L

Answer the following:

a) P(M, then C) $\frac{1}{10} \cdot \frac{1}{9} = \frac{1}{90}$	b) P(vowel, then consonant) $\frac{4}{10} \cdot \frac{6}{9} = \frac{24}{90} = \frac{4}{15}$	c) P(two vowels in a row) $\frac{4}{10} \cdot \frac{3}{9} = \frac{12}{90} = \frac{2}{15}$	d) P(two consonants in a row) $\frac{6}{10} \times \frac{5}{9} = \frac{30}{90} = \frac{5}{15}$
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