

Worksheet #3 -- Multiplication of Probabilities & Conditional Probability

1. Monica came home from school to find a bowl of 4 apples and 4 plums on the table. She decides to have a snack. First she selects one and then puts it back. She then selects another. What is the probability both selections were apples? $\frac{1}{4} = .25$

$$P(\text{apple} \& \text{apple}) = \frac{4}{8} \cdot \frac{4}{8} = \frac{1}{4}$$

2. A gymnastics team has 6 American and 4 Romanian girls. Suppose three girls are selected at random from the team. Find the probability that they are all from America. $\frac{6}{10} \cdot \frac{5}{9} \cdot \frac{4}{8} = \frac{1}{6} = .167$

3. The Scrabble tiles A, B, E, I, J, K and M are placed face down in the lid of the game and are then mixed up. Two tiles are chosen at random. Find each probability:

a. P(selecting 2 vowels) if no replacement occurs $\frac{1}{7} = .143$

b. P(selecting 2 vowels) if replacement occurs $\frac{9}{49} = .184$

c. P(selecting the same letter twice) if no replacement occurs 0

4. Christine helps her dad do the dishes. There are 5 bowls, 5 glasses, and 6 plates which need to be washed. She accidentally knocks two items off the counter and breaks them. Find each probability:

a. P(breaking 2 plates) $\frac{1}{8} = .125$

b. P(breaking 2 bowls) $\frac{1}{12} = .083$

c. P(breaking a bowl and then a glass) $\frac{5}{48} = .104$

5. Two dice are tossed. Find each probability:

a. P(two 3's) $\frac{1}{36} = .028$

b. P(no 3's) $\frac{25}{36} = .694$

c. P(3 and 4) $\frac{1}{36} = .028$

d. P(3 and any other number) $\frac{5}{36} = .139$

e. P(2 numbers alike) $\frac{1}{6}$

f. P(2 different numbers) $\frac{5}{6}$

6. A jar contains 5 peanut butter cookies, 3 caramel delights, and 7 lemon cookies. If 3 cookies are selected in succession, find the probability of selecting one of each if:

a. no cookies are replaced $\frac{1}{26} = .038$

b. each cookie is replaced $\frac{7}{225} = .031$

$P(\text{p.b and cd and lem}) = \frac{5}{15} \cdot \frac{3}{14} \cdot \frac{7}{13}$

7. You are dealt one card from a standard deck. Find the probability of getting a heart, given that the card you were dealt is a red card. $\frac{1}{2} = .5$

8. If one American is randomly selected, find the probability that the person

a. is conservative, given that the person is male $\frac{39}{100} = .39$

b. is female, given that the person is liberal $\frac{20}{36} = \frac{5}{9} = .556$

	Liberal	Moderate	Conservative
Male	16	45	39
Female	20	55	25