Honors Algebra II Chapter 10 Worksheet Name Key

1. Suzy spun a spinner with the colors red, blue, green, purple and yellow on it. Each color is equally likely to be chosen. She then rolled a die.

   a) What is the probability that the spinner landed on green and she rolled a 5?

   $\frac{1}{5} \cdot \frac{1}{6} = \frac{1}{30}$

   b) What is the probability that the spinner didn't land on blue and she rolled a even number?

   $\frac{4}{5} \cdot \frac{1}{2} = \frac{2}{5}$

   c) What is the probability that the spinner landed on a color with 6 letters in it and she rolled a number greater than 2?

   $\frac{2}{5} \cdot \frac{4}{6} = \frac{4}{15}$

2. Suzy is going to get her new license plates this weekend. The license plate is made up of six characters (letters or numbers). Assume all numbers and letters are equally likely to appear. Suzy is a big fan of the Rolling Stones. What is the probability that her plate will say 'STONES'?

   $\frac{1}{36} \cdot \frac{1}{36} \cdot \frac{1}{36} \cdot \frac{1}{36} \cdot \frac{1}{36} \cdot \frac{1}{36} = \frac{1}{2,176,782,336}$

3. Suzy got a bag of Skittles. Normally, there are 47 Skittles in a small bag. Unfortunately, 9 of the Skittles were replaced with M&Ms. If she randomly selects 12 pieces of candy, what is the probability that 4 of them will be M&Ms?

   $\frac{{}_9C_4 \cdot {}_{38}C_8}{{}_{47}C_{12}} = \frac{126 \cdot 48903492}{5.22514 \times 10^{10}} \approx .1179$

4. How many distinguishable permutations of the letters in 'Notre Dame de Sion' are there?

   $\frac{15!}{2!\,2!\,3!} = 5.448 \times 10^{10}$ (N O E)

   $\frac{15!}{1!\,2!\,3!\,2!} = 2.72 \times 10^{10}$ (N O E M)

5. Suzy goes to Mr. Goodcents for lunch. She can choose from half and whole sandwiches on 4 different kinds of bread, 5 meats, 4 cheeses, 8 veggies, and 4 condiments. How many different sandwiches can she get if she wants a half on parmesan bread with 2 meats, 5 veggies, 2 cheeses and 2 condiments?

   $1 \cdot 1 \cdot {}_5C_2 \cdot {}_8C_5 \cdot {}_4C_2 \cdot {}_4C_2 = 20,160$

6. Suzy, Maggie and Sally go out for lunch. They all decide to get a sandwich from the restaurant's menu, which includes 9 different sandwiches. If they are equally likely to pick any sandwich, what is the probability that they all pick different sandwiches?

   $\frac{9}{9} \cdot \frac{8}{9} \cdot \frac{7}{9} = \frac{56}{81}$ or .6914

7. Suzy had a box of old t-shirts. She had 11 Rolling Stones shirts (5 white and 6 black) and 8 Beatles shirts (3 white and 5 black). If she randomly picks a shirt at random, what is the probability that it is a Rollings Stones shirt or black?

$P(\text{RS or black}) = \frac{11}{19} + \frac{11}{19} - \frac{6}{19} = \frac{16}{19}$

8. How many 5 card poker hands contain:

a) 4 clubs and 1 diamond

$13C_4 \cdot 13C_1$ 9295

715 · 13

b) 3 face cards and 2 6s

$12C_3 \cdot 4C_2$ 1320

220 · 6

9. What is the probability of getting the hands described in the previous problem?

$\frac{9295}{52C_5}$ $\frac{9295}{2,598,960} = .0036$ $\frac{1320}{2,598,960} \approx 5.08 \times 10^{-4}$

10. When playing darts Suzy gets a bulls eye 62% of the time (she's really good). She throws a dart 8 times.

a) What is the probability that she gets a bulls eye every time?

$.62 \cdot .62 \cdot .62 \cdot .62 \cdot .62 \cdot .62 \cdot .62 \cdot .62 = .02183$

b) What is the probability that at least one time she doesn't get a bulls eye?

1 - P(she gets a bulls eye every time)

$1 - .02183 = .97817$

11. Expand $(x-2y)^5$

$1x^5(-2y)^0 + 5(x)^4(-2y)^1 + 10(x)^3(-2y)^2 + 10(x)^2(-2y)^3 + 5(x)(-2y)^4 + 1(x)^0(-2y)^5$

$x^5 - 10x^4y + 40x^3y^2 - 80x^2y^3 + 80xy^4 - 32y^5$

12. If you randomly pick a number from 1-20. Find the following.

a) $P(\text{even} \mid \text{divisible by } 3)$

3 6 9 12 15 18

$\frac{3}{6} = \frac{1}{2}$

b) $P(\text{prime} \mid \text{greater than } 10)$

11 12 13 14 15 16 17 18 19 20

$\frac{4}{10} = \frac{2}{5}$

13. Suzy likes to get to school at 7:30 every morning so she can study. During the first semester she stopped by Quick Trip on the way to school 60% of the mornings. She made it to school by 7:30 80% of the time if she didn't stop by QT but only 45% if she stopped. If a day from the first semester is chosen at random, what is the probability that she made it to school by 7:30?

.27 + .32 = .59