Unit 11 Day 10 HW on Probability Review

Name: ___KEY___

1) Mr. Frees goes out for pizza. He can choose from the following: small, medium, large, x-large; thin or thick crust; and pepperoni, sausage, veggie.

a) How many different combinations can he choose from?

$$4 \cdot 2 \cdot 3 = \boxed{24}$$

b) Dang! The person right in front of him (Mr. McNiff) just took the last veggie pizza. How many combinations does he have to choose from now?

$$4 \cdot 2 \cdot 2 = \boxed{16}$$

2) How many four letter "words" can you make from 9 different letters(using each only once)?

$$9 \cdot 8 \cdot 7 \cdot 6 = \boxed{3024}$$

3) Over the years, you have collected eight beautifully framed photos of your dog. You **need** to hang four of them in four spots above your bed. How many ways can you do this?

$$8 \cdot 7 \cdot 6 \cdot 5 = \boxed{1680}$$

4) You have a bag of marbles that contains 5 pink, 3 blue, and 10 yellow marbles. 18 total

a) What is the probability that you choose a pink or a blue marble?

$$5 + 3 \qquad \frac{8}{18} = \boxed{\frac{4}{9}}$$

b) What is the probability that you choose a pink, blue, or a yellow marble?

all of them

$$\boxed{1} \quad (or \ 100\%)$$

c) What is the probability that you choose a pink AND THEN a yellow marble? (Without replacement)

$$\frac{5}{18} \cdot \frac{10}{17} = \frac{50}{306} = \boxed{\frac{25}{153}}$$

d) What is the probability that you choose a pink AND THEN a yellow AND THEN a blue marble? (Without replacement)

$$\frac{5}{18} \cdot \frac{10}{17} \cdot \frac{3}{16} = \frac{150}{4896} = \boxed{\frac{25}{816}}$$

e) What is the probability that you choose a blue AND THEN a yellow marble? (With replacement)

$$\frac{3}{18} \cdot \frac{10}{18} = \frac{30}{324} = \boxed{\frac{5}{54}}$$

5) You roll a die. Here are the results:

# on Dice	Frequency
1	12
2	14
3	15
4	13
5	11
6	12
Total:	77

a) What is the theoretical probability that you roll a 6?

$$\frac{1}{6}$$

b) What is the experimental probability that you roll a 6?

$$\frac{12}{77}$$

c) What is the theoretical probability that you roll an odd number? 1,3,5

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

d) What are the actual results of when you rolled an odd number?

$$12 + 15 + 11 \qquad \frac{38}{77}$$

e) If you were to roll a die 77 times, how many times would you expect to roll a three?

$$\frac{1}{6}(77) \approx \text{about 13 times}$$

f) How many times did you actually roll a 3 in your experiment?

15 times

6) A lock has four dials. On each dial are the digits 0-9. How many possible combinations are there?

$$10 \cdot 10 \cdot 10 \cdot 10 = 10,000$$

7) You spin the spinner shown. If you spin 100 times, how many times would you expect to land on blue?

$$\frac{1}{10}(100) = 10 \text{ times}$$

↑

prob. of
landing on blue

8) How many ways can 8 cars be parked in 5 parking spots?

$$8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 = \boxed{6720}$$

9) A single die is rolled. What is the probability that the number is greater than 3 or even? **OVERLAP!**

$$\frac{3}{6} + \frac{3}{6} - \frac{2}{6} = \frac{4}{6} = \boxed{\frac{2}{3}}$$

greater than 3   even   greater than 3 and even (4,6)

10) A card is randomly selected from a standard deck of cards. What is the probability that it is an Ace or a red card?

$$\frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} = \boxed{\frac{7}{13}}$$

Red Aces

11) A card is randomly selected from a standard deck of cards. What is the probability that the card selected is a Queen or a Heart?

$$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \boxed{\frac{4}{13}}$$

Q of ♡

12) A card is randomly selected from a standard deck of cards. What is the probability that the card selected is a Queen $\underline{and}$ a Heart?

only 1!
Q of ♡

$$\boxed{\frac{1}{52}}$$

13) Four cards are selected from a standard deck. What is the probability that there are no hearts selected? (39 cards are not hearts)

$$\frac{39}{52} \cdot \frac{38}{51} \cdot \frac{37}{50} \cdot \frac{36}{49} = \frac{1974024}{6497400} = \boxed{\frac{82251}{270725}}$$

14) Two cards are selected from a standard deck. What is the probability that the first is a heart and the second is a spade, without replacement?

$$\frac{13}{52} \cdot \frac{13}{51} = \frac{169}{2652} = \boxed{\frac{13}{204}}$$