CW Key

Unit 6 – Probability
Independent & Dependent Events
Practice

Name: Key

Date: _____

Use the following bag of marbles for the questions.

Blue: B 5
Yellow: y 4
Green: G 3
Purple/Pink: P 8/20

1. What is the sample space? 20
2. How many blue marbles? 5
3. How many yellow marbles? 4
4. How many green marbles? 3
5. How many pink marbles? 8
6. How many total marbles? 20
7. What is the theoretical probability of choosing a blue marble? 5/20
8. What is the theoretical probability of choosing a yellow marble? 4/20
9. What is the theoretical probability of choosing a green marble? 3/20
10. What is the theoretical probability of choosing a pink marble? 8/20
11. What is the theoretical probability of choosing a green or pink marble? 11/20
12. If you choose a marble, put it back in the bag, then pick another marble, would that be considered an independent event or dependent event? Independent
13. What is the probability of choosing a pink marble first, putting it back, and then choosing a blue marble? 8/20 x 5/20
14. What is the probability of choosing a green or pink marble first, putting it back, and then choosing a blue marble? 11/20 x 5/20 = 11/80
15. What is the probability of choosing a pink or yellow marble first, putting it back, and then choosing a green marble? 12/20 x 3/20
16. What is the probability of choosing a yellow or green marble first, putting it back, and then choosing a blue or a pink marble? 7/20 x 13/20
17. What is the probability of choosing a blue marble, putting it back, and then choosing another blue marble? 5/20 x 5/20
18. What is the probability of choosing a green marble, putting it back, then choosing a yellow marble, putting it back, and then choosing another green marble? 3/20 x 4/20 x 3/20
19. If you choose a marble, leave it out of the bag, then pick another marble, would that be considered an independent event or dependent event? Dependent
20. What is the probability of choosing a pink marble first, putting it on the table, and then choosing a blue marble? 8/20 x 5/19 =
21. What is the probability of choosing a green or pink marble first, leaving it out, and then choosing a blue marble? 11/20 x 5/19 =
22. What is the probability of choosing a pink or yellow marble first, putting it on the table, and then choosing a green marble? 12/20 x 3/19 =
23. What is the probability of choosing a yellow or green marble first, putting it on the table, and then choosing a blue or a pink marble? 7/20 x 13/19 =
24. What is the probability of choosing a blue marble, leaving it out of the bag, and then choosing another blue marble? 5/20 x 4/19
25. What is the probability of choosing a green marble, putting it on the table, then choosing a yellow marble, putting it on the table, and then choosing another green marble? 3/20 x 4/19 x 2/18
26. What is the probability of choosing a yellow marble, putting it back in the bag, then choosing a pink marble, leaving it on the table, and then choosing a green marble? 4/20 x 8/20 x 3/19
27. What is the probability of choosing a yellow marble, leaving it on the table, choosing a green or pink marble, putting it back in the bag, and then choosing another yellow marble? 4/20 x 11/19 x 3/19

Challenge Questions:

1. 10 cards are numbered 1 through 10. Cards are well shuffled and the cards are drawn at random.
   a. Three cards are drawn without replacement. The first and second cards show 4 and 6 respectively. Find the probability of selecting an even number in a third draw. 2, 8, 10 (3/8)
   b. If the conditions are the same as in question 1, find the probability of selecting an odd number on the third draw. 1, 3, 5, 7, 9 (5/8)
   c. If two cards are drawn with replacement, find the probability of choosing a prime number on both the first and second draws. 2, 3, 5, 7 4/10 x 4/10 (16%)
   d. If two cards are drawn without replacement, find the probability of drawing a 4 or 5 on the first draw and any even prime on the second draw. 2 2/10 x 1/9 = 2/90 = (1/45)

Pg 1

me: ANSWER KEY CLASSWORK

: Independent vs. Dependent Events

- Independent Events -

ag A contains 9 red marbles and 3 green arbles. Bag B contains 9 black marbles d 6 orange marbles. Find the probability selecting one green marble from bag A d one black marble from bag B.

3/20 Probability A occurs × Probability B occurs

A: 9R 3G (=12)
B: 9B 6O (=15)

$\frac{3}{12} \times \frac{9}{15} = \frac{1}{4} \times \frac{3}{5}$

2. Two seniors, one from each government class are randomly selected to travel to Washington, D.C. Wes is in a class of 18 students and Maureen is in a class of 20 students. Find the probability that both Wes and Maureen will be selected.

1/360 $\frac{1}{18} \times \frac{1}{20} =$

3. If there was only one government class, and Wes and Maureen were in that class of 38 students, what would be the probability that both Wes and Maureen would be selected as the two students to go to Washington? Is this still an example of independent events?

$\frac{1}{38} \times \frac{1}{37} = \frac{1}{1,406}$ No, this now decreases the other's chance

- Dependent Events -

A box contains 5 purple marbles, 3 green marbles and 2 orange marbles. Two consecutive draws are made from the box **without replacement** of the first draw. Find the probability of each event.

a. P(orange first, green second)

1/15 $\frac{2}{10} \times \frac{3}{9} = \frac{6}{90} =$

5P, 3G, 2O = 10

b. P(both marbles are purple)

2/9 $\frac{5}{10} \times \frac{4}{9} = \frac{20}{90}$

c. P(the first marble is purple, and the second is ANY color EXCEPT purple)

5/18 $\frac{5}{10} \times \frac{5}{9} = \frac{25}{90}$

5. If you draw two cards from a standard deck of 52 cards without replacement, find:

a. P(King first, Jack second)

4/1063 $\frac{4}{52} \times \frac{4}{51}$

b. P(face card first, ace second)

4/221 K, Q, J × 4 = 12 $\frac{12}{52} \times \frac{4}{51} = \frac{48}{2652}$

c. P(2 aces)

1/221 $\frac{4}{52} \times \frac{3}{51} =$

6. Alicia selects at random from a box of thin crust pizzas. Each slice has a topping of mushrooms, pepperoni, or sausage.

a. How many outcomes are there?

3

b. P(sausage or mushrooms)

2/3 OR = add

c. P(thin crust or pepperoni)

3/3 100%

d. P(sausage or thick crust)

1/3

e. P(thick or thin crust)

3/3

7. A card is drawn from the bag at the right. (8 cards)

a. How many outcomes are there?

8

b. P(3 or a 5)

2/8 = 1/4

SKIP

c. P(even or a prime)

2, 4, 6, 8 — 2, 3, 5, 7

7/8 (every # but 1)

SKIP

1 2 3 4 5 6 7 8

d. P(3 or less than 2)

2/8 = 1/4

8. A die is rolled and a spinner is spun.

a. How many outcomes are there?

Day #2

b. P(1 and A)

c. P(odd and B)

not enough info

d. P(composite and C)

e. P(prime and D)

f. P(1 and E)

9. In a bag there are 2 red marbles, 3 white marbles and 5 blue marbles. Once a marble is selected, it is NOT replaced. Find the following probabilities:

a. P(red, then white)

Pepperoni

$\frac{2}{10} \times \frac{3}{9} = \frac{6}{90} = \frac{1}{15}$ 2R 3W 5B 10

b. P(blue, then red)

$\frac{5}{10} \times \frac{2}{9} = \frac{10}{90} = \frac{1}{9}$

c. P(red, red, red)

0% only 2 reds

d. P(blue, blue, white)

$\frac{5}{10} \times \frac{4}{9} \times \frac{3}{8} = \frac{60}{720} = \frac{1}{12}$

then/and = multiply