Unit 19 Probability Review

19.1 I can use the Fundamental Counting Principle to count the number of ways an event can happen.

1. What is sample space?

All possible outcomes

2. What is the difference between theoretical and experimental probability?

theoretical what should happen experimental what does happen

3. How many ways can you arrange 6 books on a shelf?

720

4. Kim has 5 swimsuits, 4 pairs of sandals, and 3 beach bags. In how many ways can she pick one of each?

60

5. A pizza restraint offers 2 different crusts, 2 sauce choices, 5 meat options and 4 veggie options. If a customer can pick only one option from each category how many pizzas could be created?

80

6. The Smiths plan on having 3 children. Draw a tree diagram to represent the possible outcomes
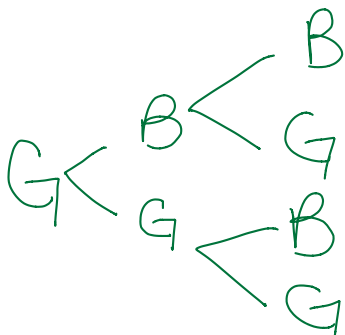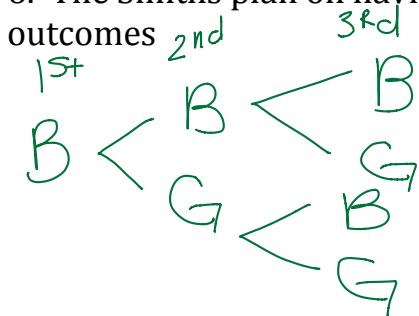
19.2 I can find combinations for an event.

7. $_7C_3$ 35

8. $_{12}C_4$ 495

9. $_5C_5$ 1

10. $_9C_0$ 1

11. Pick 3 videos from 10

120

12. 2 letter from LOVE

6

13. A team of 12 players is to be chosen from 18 available players. In how many ways can this be done?   18564

19.3 I can find permutations for an event.

14. $_7P_3$ 210

15. $_{12}P_4$ 11880

16. $_5P_5$ 120

17. $_9P_0$ 1

18. In how many ways can all the letters of the word WORK be arranged?

24

19. A disk jockey can play 8 songs in one time slot. In how many different orders can the eight songs be played?   40320

20. A certain type of luggage has room for three initials. How many different 3 letter arrangements of the letters are possible?

15600

19.4 I can find the probability of mutually exclusive and non-mutually exclusive events.

21. Define mutually exclusive events.

Two events that have nothing in common

22. Give an example of 1 mutually exclusive event and one not mutually exclusive event.

23. In a math class there are 18 juniors and 10 seniors; 6 of the seniors are females and 12 of the juniors are males. If a student is selected at random find the probability of selecting the following

a. A junior or a female

b. A senior or a female

c. A junior or a Senior

24. Find the probability of choosing a penny or a dime from 4 pennies, 3 nickels and 6 dimes.

10/13

25. Find the probability of selecting a boy or a blond-haired person from 12 girls, 5 of whom have blond hair, and 15 boys, 6 of whom have blond hair.

20/27

26. Find the probability of drawing a king or queen from a standard deck of cards.

2/13

27. The probability for a driver's license applicant to pass the road test the first time is 5/6. The probability of passing the written test on the first attempt is 9/10. The probability of passing both tests the first time is 4/5. Are the events mutually exclusive? What is the probability of passing either test on the first attempt?

14/15

19.5 I can find the probability of independent and dependent events.

3. One deck of cards is numbered 1-12 and a second deck of cards is numbered 1-9. A card is drawn from the 12 card deck, then from the 9 card deck. Find the probability:

a) P(4 and 4) __1/108__

d) P(not 5 or 8 and an even #) __10/27__

b) P(an even # and an odd #) __5/18__

e) P(not 11 and a factor of 9) __11/36__

c) P(a factor of 10 and a multiple of 3) __1/9__

f) P(a composite # and a prime #) __5/18__

Your drawer contains 10 red socks and 6 blue socks. It's too dark to see which are which, but you grab two anyway. What is the probability that both socks are blue?

1/8

(2) You accidentally dropped a coin from the top of 10 stairs. What is the probability that it will land on the fourth step, tails up?

1/20

A shuffled deck of cards is placed face-down on the table. It contains 4 hearts, 3 diamonds, 6 clubs and 2 spades. What is the probability that the top two cards are both clubs?

1/7

(4) The names of 8 boys and 7 girls from your class are put into a hat. What is the probability that the first two names chosen will both be boys?

4/15

An animal cage is holding 6 black cats and 7 white cats. None of them want to be in there. The cage door is opened slightly and two cats escape. What is the probability that one of of each color escapes?

7/26

(6) A box contains 7 purple marbles, 9 orange marbles and 11 yellow marbles. If you pick two without looking, what is the probability that both will be orange?

4/39

19.7 I can solve problems involving conditional probability.

35. Andrea is a very good student. The probability that she studies and passes her mathematics test is $17/20$. If the probability that Andrea studies is $15/16$, find the probability that Andrea passes her mathematics test, given that she has studied.

36. The probability that Janice smokes is $3/10$. The probability that she Smokes and develops lung cancer is $4/15$. Find the probability that Janice develops lung cancer, given that she smokes.

37. The probability that Sue will go to Mexico in the winter and to France in the summer is 0.40. The probability that she will go to Mexico in the winter is 0.60. Find the probability that she will go to France this summer, given that she just returned from her winter vacation in Mexico.

38. A penny and a nickel are tossed. Find the probability that the penny Shows heads, given that the nickel shows heads.

39. A penny is tossed. Find the probability that it shows heads. Compare this answer to your answer to #4 and explain the results.

40. A spinner with dial marked as shown is spun once. Find the probability that it points to an even number given that it points to a shaded region:
    a) directly
    b) using conditional probability formula
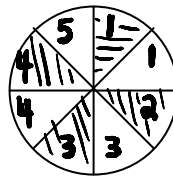
41. A family that is known to have two children is selected at random from amongst all families with two children. Find the probability that both children are boys, given that there is a boy in this family.

42. A die is tossed. Find $P(less than 5 \mid even)$.

43. A number is selected, at random, from the set $\{1,2,3,4,5,6,7,8\}$. Find:
    a) $P(odd)$
    b) $P(prime \mid odd)$

44. A box contains three blue marbles, five red marbles, and four white marbles. If one marble is drawn at random, find:
   a) $P(blue \mid not\ white)$
   b) $P(not\ red \mid not\ white)$

45. A number is selected randomly from a container containing all the integers from 10 to 50. Find:
   a) $P(even \mid greater\ than\ 40)$
   b) $P(greater\ than\ 40 \mid even)$
   c) $P(prime \mid between\ 20\ and\ 40)$

46. A coin is tossed. If it shows heads, a marble is drawn from Box 1, which contains one white and one black marble. If it lands tails, a marble is drawn from Box 2, which contains two white and one black marble. Find:
   a) $P(black \mid coin\ fell\ heads)$
   b) $P(white \mid coin\ fell\ tails)$

ANS:

35. $\dfrac{68}{75}$ 36. $\dfrac{8}{9}$

37. $\dfrac{2}{3}$ 38. $\dfrac{1}{2}$

39. $\dfrac{1}{2}$, heads appearing is independent

40. a) $\dfrac{1}{2}$ b) $\dfrac{1}{2}$ 41. $\dfrac{1}{3}$

42. $\dfrac{2}{3}$ 43. a) $\dfrac{1}{2}$ b) $\dfrac{3}{4}$

44. a) $\dfrac{3}{8}$ b) $\dfrac{3}{8}$ 45. a) $\dfrac{1}{2}$ b) $\dfrac{5}{21}$ c) $\dfrac{4}{19}$

46. a) $\dfrac{1}{2}$ b) $\dfrac{2}{3}$