Secondary 2 Honors   Name: ___Key___

Unit 11: Test Review

1) Given the sample space of the letters in the word MATHEMATICS.

a) List the sample space using the correct notation:

$$S = \{M, A, T, H, E, M, A, T, I, C, S\}$$

b) List a subset of vowels, call it A.

$$A = \{A, E, A, I\}$$

c) List A^c.

$$A^c = \{M, T, H, M, T, C, S\}$$

d) List the subset of the letters that repeat, call it B.

$$B = \{M, A, T\}$$

e) List all the outcomes for $A \cap A^c$.

$$A \cap A^c = \varnothing$$

f) List all the outcomes for $A \cup B$.

$$A \cup B = \{A, E, I, M, T\}$$

2) Given the sample space of a 10-sided die.

a) List the sample space:

$$S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

b) List a subset of the factors of 10, call it A.

$$A = \{1, 2, 5, 10\}$$

c) List A^c.

$$A^c = \{3, 4, 6, 7, 8, 9\}$$

d) List the subset of even numbers, call it B.

$$B = \{2, 4, 6, 8, 10\}$$

e) List all the outcomes for $A \cap A^c$.

$$A \cap A^c = \varnothing$$

f) List all the outcomes for $A \cup B$.

$$A \cup B = \{1, 2, 4, 5, 6, 8, 10\}$$

3) With "Spring" in Utah coming, there are many people who are out sick. Many of the sick people have siblings that attended elementary school where the kids don't wash their hands as much. In a classroom poll, 62% of the students who were sick have younger siblings. Of the 38% who are not sick, only 26% of them don't have younger siblings.

a) Use a tree diagram to represent the possibile probabilities.

Sick .62
.62 — Younger siblings
.38 — No younger siblings

Not sick .38
.74 — Younger siblings
.26 — No younger siblings
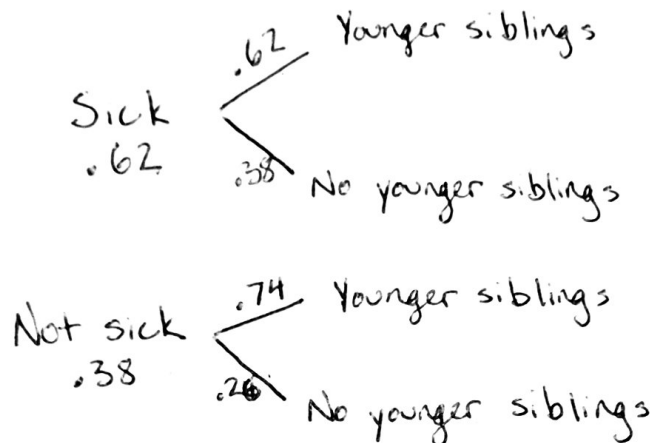
b) Find P(Sick and having a younger sibling) 38.44%

c) Find P(Not sick and having a younger sibling) 28.12%

d) Find P(Sick or having a younger sibling)

90.12%

4) You have the following: a spinner with 7 choices, a six-sided die, and a coin.

a) Use a tree diagram to represent the following: A choice on the spinner, rolling a 3 or 4 vs everything else on the die, and heads or tails.

Spin 0.14
0.33 — 3 or 4
0.5 — Heads
0.5 — Tails
0.67 — 1,2,5,6
0.5 — Heads
0.5 — Tails
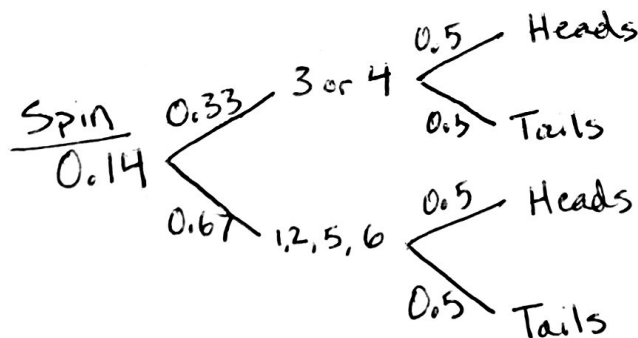
b) Find P(6, 3 or 4, H) 2.31%

c) Find P(4, not 3 or 4, T) 4.69%

d) Find P(7, 3 or 4, H) 2.31%

5) Use the Venn Diagram to answer the following:

A class was polled on whether they had skied before.

Mr. K's Class

Female   Skied Before

29

19   9   43
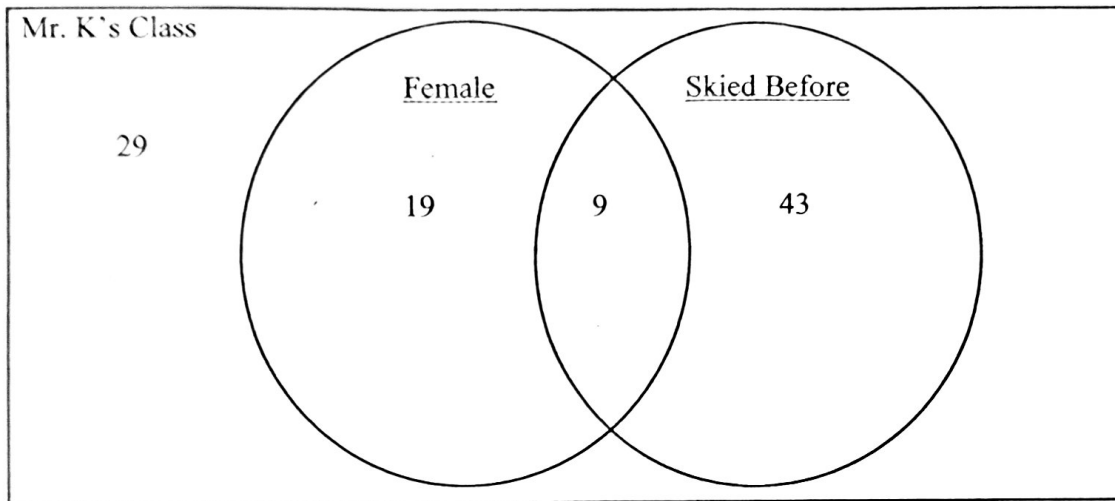
a) P(Skiing | Female) 32.14%

b) P(Female | Not skied) 39.58%

c) P(Male | Not skied) 60.42%

d) P(Not skied | Male) 40.28%

e) What is the probability of Jennifer having skied before? 9%

f) What is the probability of a non-skier being male? 60.42%

6) Use the table to answer the following:

A class was polled on whether they read the Harry Potter books or just watched the movies.

	Read the books	Didn't read the books	Total
Watched the movies	22	16	38
Didn't watch the movies	3	9	12
Total	25	25	50

a) P(Books | Movies) 57.89%

b) P(No books | No movies) 75%

c) P(Movie | No book) 64%

d) P(Movie | Book) 88%

e) P(No movie | No book) 36%

f) P(Book | No movie) 25%

7) Make a two-way frequency table with the following information:

William has two-dozen donuts. He has nine chocolate frosting donuts: three are cake type, two are bars, and four are regular. He has seven glaze frosting donuts: three are cake type, two are bars, and two are regular. He also has ones with sprinkles: two are cake type, four are bars, and two are regular.

	Chocolate	Glaze	Sprinkles	Total
Cake	3	3	2	8
Bars	2	2	4	8
Regular	4	2	2	8
Total	9	7	8	24

a) Is the probability of choosing a donut that chocolate independent of choosing a donut that is cake-type?

$$No, \ P(Choc|Cake) \neq P(Choc)$$

b) Is the probability of choosing a regular donut independent of choosing one with sprinkles?

$$No, \ P(Reg|sprink) \neq P(Reg)$$

8) Surgeries involving implants sometimes result in the patient's body rejecting the implant. A certain surgery has a rejection rate of 11%. The rest of the patient's bodies successfully accept the implant. Assume the results for each patient are independent.

a) In a random sample of 8 of these surgeries, find the probability that at least one patient rejects the implant.

60.63%

9) Maggie is a basketball player who makes 75% of the free-throws she attempts. Assume that the results of each shot are independent.

a) If Maggie attempts 3 free-throws, find the probability that she misses at least one free-throw.

14.06%

b) If Maggie attempts 5 free-throws, find the probability that she makes at least one free-throw.

99.90%

10) A bag contains 7 blue marbles, 3 green marbles, 6 red marbles, 1 white marble, and 4 black marbles. Find the following probabilities assuming that you do not replace each marble after it has been drawn.

   a) Find P(White and Green and Red)

   0.23%

   b) Find P(White or Black)

   23.81%

   c) Find P(Blue, Green, Red, White, Black)

   0.02%

11) Using a 3 section spinner labeled A, B, and C. Find the following probabilities.

   a) If you spin the spinner 4 times what is the probability that the spinner lands on A all four times.

   1.23%

   b) If you spin the spinner 6 times, what is the probability that the spinner doesn't land on C in any of the 6 spins.

   8.78%

12) You and a friend each flip a coin one time.

   a) What is the probability that you and your friend both get heads?

   25%

   b) What is the probability that one of you gets heads and the other gets tails?

   25%

   c) What is the probability that neither one of you get a heads?

   25%

13) Determine if the game is fair. A coin is flipped; if it lands on heads I win, if it lands on tails you lose.

   Not fair

14) Determine if the game is fair. A random card is selected from a standard deck of 52 cards. Player 1 wins if the card is a Diamond or if the card is a face card (Jack, Queen, or King) from any suit. Player 2 wins if the card is a Spade or if the card is a factor of 10 (Ace equals 1) from any suit.

   Not fair, player 2 has a higher probability of winning