GRADE12 APPLIED PROBABILITY
SAMPLE SPACES

Name: _____
Date: _____

Show work! Show all probabilities as a properly reduced fraction and as a percent rounded to nearest 0.01%)

Use a calculator to its full effect! (eg: for fractions!)

1. A fair die is rolled once.

   a. List all possible outcomes (*ie*: make the sample space set).

   b. Since each outcome is equally likely, what is the theoretical probability that the outcome is greater than four [*ie*: Prob(roll>4)]?

2. A pizza restaurant offers four meat toppings (pepperoni, ham, sausage, and bacon) and three vegetables (tomato, peppers, and onions). There is a special for two topping pizzas.

a. Draw a tree diagram to show all possible combinations of toppings if there is only one meat and only one vegetable topping.

b. How many different **combinations** are possible?

c. What is the probability of selecting a bacon-tomato topping if the toppings are selected randomly?

3. Harland's wardrobe consists of two pairs of pants (green and black), three shirts (white, black, and purple), and two pairs of shoes (white and black).

a. Draw a tree diagram to show all possible clothing combinations that are available to Harland. How many combinations are available?

b. One day during a power outage, Harland gets dressed in total darkness and so he randomly selects his shirt, pants, and shoes. What is the probability that he will be dressed entirely in black?

4. Bob is taking a true-false test and has no idea of the answers to the last three questions. He decides to guess at the answers.

a. If each level of the tree represents each of the questions, draw a tree diagram for this experiment.

b. If *C* stands for correct answer and $\bar{C}$ stands for wrong answer, list all of the possible outcomes of his 3 guesses (*ex.C, C,* $\bar{C}$ is one possible outcome)

c. Find the probability that he guesses all three answers correctly.

d. Describe the complementary event to guessing all three correctly and determine what is its probability.

5. In order to negotiate a maze, a laboratory mouse has to go left (**L**) or right (**R**) at each fork in the maze (and cannot go back the way it came). The mouse will encounter **four** forks and is **equally likely** to turn L or R.

a. List all the choices the mouse can make. A tree diagram may be helpful.

b. Determine the following probabilities:

(i) P(mouse turns left three times)

(ii) P(mouse always turns right)

(iii) P(mouse turns right **at most** three times)

(iv) P(mouse *alternates* directions)

6. The school **bus arrives** regularly at the bus stop any random time from **8:10** to **8:15** inclusive each morning. Tardy Tina arrives at the bus stop each morning any random time from **8:13** to **8:16** inclusive. She gets a bus ride only if she is on time, because the bus driver will not wait for anyone. Assume that all the times of arrival are equally likely, and that times are expressed only as whole minutes.

a. Create a sample space [table] for the above situation; a table of Tina arrival times vs Bus arrival times that shows the *success* or *failure* of Tina catching the bus.

		Bus Arrives (minutes after 8)					
		10	**11**	**12**	**13**	**14**	**15**
Tina Arrives	**13**	✗					
	14						
	15						✓
	16						

b. How many outcomes are there in the sample space?

c. What is the probability that Tina will catch her bus?

SUGGESTION!

If there are only two choices of possible outcome (left & right), (correct, incorrect) then the resultant combinations are often better determined using the Pascal triangle.