Name:	Date:

Assignment 3: Permutations & Combinations

Expectations

Assessment	KU:	APP:	COMM:

Through this assignment, you will have the opportunity to…

_____ distinguish between situations that require permutations or combinations as a solution strategy

_____ I can solve simpler problems that involve permutations or combinations and express my solutions using appropriate notation—e.g., n!, P(n, r), ($\binom{n}{r}$)

_____ I can solve counting problems that involve an additive principle ("or") or a multiplicative principle ("and")

Instructions

Answer each of the problems that follow on lined paper. If you would prefer to complete your assignment 'into' Onenote, you're welcome to do so. The communication aspect of your solution will be assessed using the criteria at the end of the assignment. Also show work for the multiple choice items.
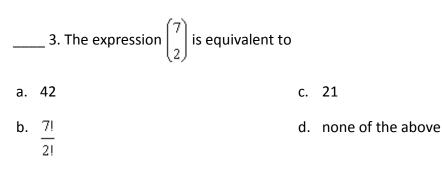
Part A-Knowledge & Understanding (KU)

_____ 1. Express $15 \times 14 \times 13$ in a different manner.

a. P(15, 13)   c. $\dfrac{15!}{12!}$

b. $\dfrac{15!}{2!13!}$ d. P(15, 12)

_____ 2. The expression $\dfrac{14!}{6!8!}$ is equivalent to

a. P(14, 6)

b. $_{14}C_8$

c. the number of ways that 6 out of 14 can be arranged

d. none of the above

_____ 3. The expression $\binom{7}{2}$ is equivalent to

a. 42

c. 21

b. $\dfrac{7!}{2!}$

d. none of the above

4. Determine the number of three letter arrangements using the letters of the word METAPHOR.

5. Determine the number of ways the 8 members of the Junior Jazz Band can stand in a line if Val must be first, Tim sixth, and Tricia last.

6. From a group of seven junior and ten senior students, determine how many committees of six students can be *chosen* if four are junior students.

_____ 7. The letters of the word SIMILE are scrambled. Determine the probability that the word is spelled exactly backwards.

a. $\dfrac{1}{720}$

c. $\dfrac{1}{6}$

b. $\dfrac{1}{360}$

d. none of the above

Part B—Application

1. At a used car lot, six cars for sale are to be parked side-by-side. In how many different ways can this be done if…

a) The one (and only) car with a sunroof must be at the right end of the line?

b) The three black cars must be together?

2. The starting line-up of a co-ed volleyball team must be made up of 3 males and 3 females. If the team has 9 females and 8 males, determine the probability that Emma, Mary, and Brittany are selected for the line-up.

3. A Canadian postal code consists of 6 characters of 3 letters alternating with 3 digits. An example is M4N 0R3.

a) Determine the total number of possible codes.

b) Mo would like to have a postal code that has his name somewhere in it, and 7, his favourite number. How many codes fit these criteria?

c) If all postal codes were randomly generated, determine the probability that Mo will get to use his postal code.

Knowledge & Understanding (Overall) Rubric   Name: _____

Criteria			
I'm demonstrating an effective application of knowledge and skills (understanding and application of procedures)	*Approaching*	*On Target*	*Working to Exceed*
Notes			

Application Rubric

Criteria			
I'm demonstrating an effective application of knowledge and skills (understanding and application of procedures)	*Approaching*	*On Target*	*Working to Exceed*
Question 1			
Question 2			
Question 3			

Communication (Overall) Rubric

Criteria			
Interpret information correctly and make reasonable statements?	*Approaching*	*On Target*	*Working to Exceed*
Consistently use mathematical conventions correctly—use of symbols, key terms, labels, solutions written from top to bottom of page	*Approaching*	*On Target*	*Working to Exceed*
Include and integrate both mathematical forms and narrative (i.e., descriptive, explanatory) forms	*Approaching*	*On Target*	*Working to Exceed*
Provide explanations and justifications that would be clear for a range of audiences (e.g., peers and teacher)	*Approaching*	*On Target*	*Working to Exceed*