MDM4U: Unit 2 Test Review

Communication: Same and Different. Classification.

1. Describe a counting problem	1. Counting problems want to know how many things can be generated using a large set of values. 2. They allow repeats. 3. Order matters. 4. E.g., How many 4 number PINs exist?
2. Describe a factorial problem.	1. Factorial problems want to know how many ways a small set of values can be arranged. 2. Order matters. 3. E.g., How many ways can 4 people line up?
3. Describe a permutations problem.	1. Permutations want to know how many ways SOME OF a set of values can be arranged. 2. Order matters. 3. Pick. 4. E.g., How many ways can you find a 1^{st}, 2^{nd} 3^{rd} place finisher from a race of 8 people?
4. Describe a permutations with restrictions problem.	1. A small set of values is arranged, but restrictions are place on some of the values. 2. Order matters. 3. E.g., How many ways can 6 people line up if Adisa must be first?
5. Describe a permutations with repeats problem.	1. A small set of values is arranged, but some of the values are repeated. 2. Order matters. 3. If you have all the values, there is a formula. If only some of the values, you must use cases. 4. E.g., How many ways can you arrange 3 letters of CANADA?
6. Describe a circular permutations problem.	1. A set of values is arranged in a circle. 2. Order matters. 3. E.g., How many ways can 8 gemstones be arranged around a ring?
7. Describe a combinations problem.	1. A sub-group is selected from a larger group. 2. Order does not matter. 3. Choose. 4. E.g., You choose a group of 4 from a 20 member club?

Knowledge: Formulas

1. What is the formula for n!	n x (n-1)!
2. What is the formula for n things arranged in a circle?	(n-1)!
3. What is the formula for P(n,r)?	$\frac{n!}{(n-r)!}$
4. What is the formula for C(n,r)?	$\frac{n!}{(n-r)!\,r!}$
5. What is the formula for factorials with repeats?	$\frac{n!}{a!\,b!\,c!}$
6. What is the Excel formula for C(4,3)	=combin(4,3)
7. What is the Excel formula for P(4,3)	=permut(4,3)
8. What is the Excel formula for 5!	=fact(5)