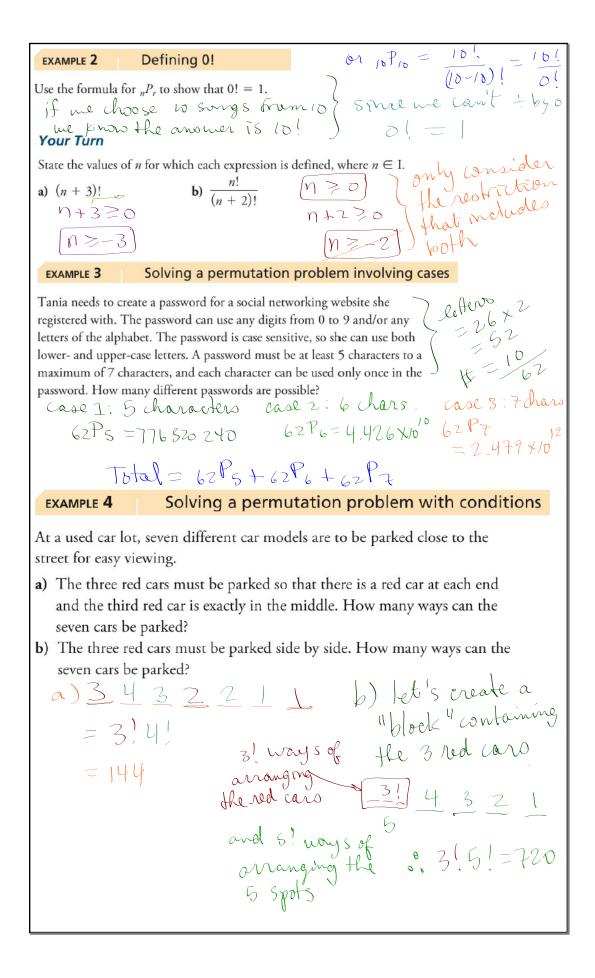
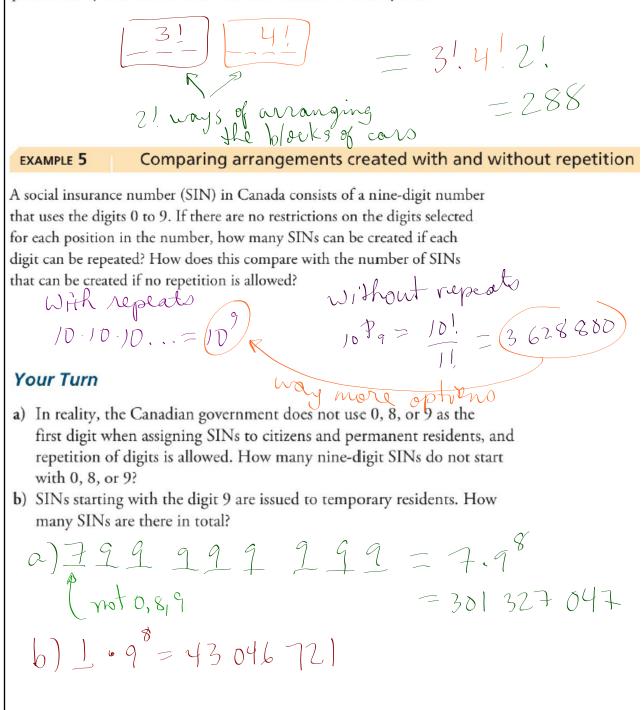
## <u>4.3 Permutations when all Objects are Distinguishable</u> How many 3-letter "words" can you make with the letters MATH? <u> 4 3 2</u> = 24 Investigate pg. 246 in groups Communication Notation $_{p}P_{r}$ is the notation commonly used to represent the number of permutations that can be made from a set of n different objects where only *r* of them are used in each arrangement, and $0 \le r \le n$ . When all available objects are used in each arrangement, n and r are $nP_r = \frac{n!}{(n-r)!}$ equal, so the notation $_{n}P_{n}$ is used. γ). Solving a permutation problem where only some EXAMPLE 1 of the objects are used in each arrangement Matt has downloaded 10 new songs from an online music store. He wants to create a playlist using 6 of these songs arranged in any order. How many different 6-song playlists can be created from his new downloaded songs? $\frac{1098765}{4!} = \frac{10!}{4!} = 151200$ $10P_6 = \frac{10!}{(10-6)!} = \frac{10!}{4!} = 151200$ Your Turn Determine all the possible 7-song playlists, then 8-song playlists, and finally 9-song playlists that you can create from 10 songs. How does the value of mereases more since there are from. options to choose from. $_{n}P_{r}$ change as r gets closer to n? Is this what you would have predicted? Explain. 10Pz = 604 800 $10P_8 = 1814400$ 10Pg = 3 628000 $10P_{10} = 10! = 3628000$



## Your Turn

How many ways can the seven cars be parked if the three red cars must be parked side by side and the other four cars must also be side by side?



Homefun pg. 255 #1, 2, 5, 7, 9, 10, 11, 13, 14\*, 15, 18