

# MAT 141 Homework 4

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Problem 1	Grade:
	<i>Faculty Comments</i>

Problem 2	Grade:
<p>To do this question I'll assume that the letters can only ever be uppercase and the numbers are 0-9. Assuming that licence plates are four letters followed by three numbers:</p> <p>(a) The number of plates possible is all the permutations of 4 letters and 3 digits:</p> $\frac{26!}{(26-4)!} * \frac{10!}{(10-3)!} = 1,235,520,000$ <p>(b) The number of plates that start with A and end with 0 is all the permutations of 3 letters and 2 digits, since we're given the first and last characters:</p> $\frac{26!}{(26-3)!} * \frac{10!}{(10-2)!} = 26 * 25 * 24 * 10 * 9 = 1,404,000$ <p>(c) The number of plates that are completely unique is the number of combinations of 26 letters taken 4 at a time times the number of combinations of 10 numbers taken 3 at a time:</p> $\binom{26}{1} * \binom{26}{1} * \binom{26}{1} * \binom{26}{1} * \binom{10}{1} * \binom{10}{1} * \binom{10}{1} = 45,697,600$	<i>Faculty Comments</i>

Problem 3	Grade:
<p>Given our graph:</p> <p>(a) You can get there <math>2 + 3(4) = 14</math> different ways.</p> <p>(b) This is roughly the same as above - <math>3(4) = 12</math> different ways.</p>	<i>Faculty Comments</i>

Problem 4	Grade:
<p>Given that a student council has 8 men and 7 women:</p> <p>(a) We can form a committee with 3 men and 3 women in:</p> $\binom{8}{3} * \binom{7}{3} = 1176 \text{ ways.}$ <p>(b) We can form a six person committee with at least one woman in:</p> $\binom{15}{5} = 3003 \text{ ways.}$	<p><i>Faculty Comments</i></p>
Problem 5	Grade:
<p>In the word HULLABALOO, there are 3 L's, 2 A's, 2 O's, 1 H, 1 B, and 1 U, for 6 distinct letters in total. There are also 10 letters in total. So, the number of permutations of the word can be found by doing:</p> $\binom{10}{3} * \binom{7}{2} * \binom{5}{2} * \binom{3}{1} * \binom{2}{1} * \binom{1}{1} = 151,200 \text{ ways.}$	<p><i>Faculty Comments</i></p>
Problem 6	Grade:
<p>Given that <math>n</math> is a positive integer, then we can find the number of solutions to <math>1 \leq i \leq j \leq k \leq l \leq n</math> by doing:</p>	<p><i>Faculty Comments</i></p>