

Name: \_\_\_\_\_

Student #: \_\_\_\_\_

Date: \_\_\_\_\_

T.A. #: \_\_\_\_\_

**Mathematics 12 Pre-Calculus**  
**LEARNING GUIDE 18 TEST – PERMUTATIONS & COMBINATIONS**  
**/17**

**\*Full marks will NOT be given for the final answer only.**

When using a calculator, you should provide a decimal answer that is correct **to at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

1. A restaurant offers 2 appetizers, 4 main courses, and 3 deserts. How many different meals can one select? (1 mark)
  
  
  
  
  
  
  
  
  
  
2. How many three letter permutations are there in the word FRAGILE? (1 mark)
  
  
  
  
  
  
  
  
  
  
3. How many ways can 6 books be arranged on the shelf if: (1 mark each)
  - a) The books are all different?
  
  
  
  
  
  
  
  
  
  
  - b) Two of the books are the same?
  
  
  
  
  
  
  
  
  
  
  - c) The French book must be on one of the ends?

4. License plates for cars in BC consist of three numbers followed by 3 letters. Assuming numbers and letters can be repeated, how many different license plates are possible? (1 mark)

5. Explain what  ${}_7P_3$  means. Explain why does  ${}_3P_7$  not make sense. (2 marks)

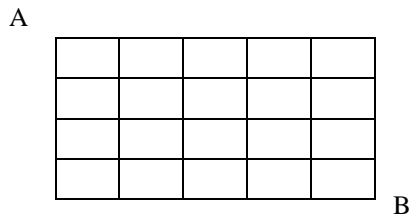
6. Solve for n. (1 mark each)

a)  ${}_nP_2 = 30$

b)  ${}_{n+2}C_n = 21$

7. A work crew consists of 10 people. How many ways can a group of four be selected for a job? (2 marks)

8. How many possible ways can a person get from A to B if one can only move down or to the right? (1 mark)



9. Expand  $(a - 2b)^3$  using the binomial theorem. (2 marks)

10. Determine the indicated term.

a) the 5<sup>th</sup> term in the expansion of  $(x + 2)^{12}$ . (1 mark)

b) the middle term in the expansion of  $(x - 3)^{10}$ . (1 mark)