1. Identify the following either as a permutation or combination.
   
   a) The items in a fruit salad
   
   b) The combination to a lock
   
   c) The placing of contestants in a pageant
   
   d) The numbers picked for the lottery

2. Find the number of distinct permutations to rearrange the following sets:

   A) \{1, 2, 3, 4, 5, 6, 7, 8\}       B) \{\text{letters A – M}\}

3. Find the number of permutations:

   A) \(5^P_3\)       B) \(8^P_2\)       C) \(999^P_1\)

4. Find the number of combinations:

   A) \(10^C_5\)       B) \(10^C_7\)       C) \(28^C_{28}\)
Consider the burger menu at Five Guys (yum):

- hamburger
- cheeseburger
- bacon burger
- bacon cheeseburger
- little hamburger
- little cheeseburger
- little bacon burger
- little bacon cheeseburger

- Mayo
- Relish
- Onions
- Lettuce
- Pickles
- Tomatoes
- Grilled Onions

- Grilled Mushrooms
- Ketchup
- Mustard
- Jalapeno Peppers
- Green Peppers
- A.1.® Steak Sauce
- Bar-B-Q Sauce
- Hot Sauce

5. How many ways can Mr. Marsh choose a burger with no cheese and 1 topping?

6. How many ways can Mr. Marsh choose a little burger with two toppings?

7. How many ways can Mr. Marsh choose any two burgers with 10 toppings?

8. How many ways can Mr. Marsh choose any burger with at most 5 toppings? (show work!)

Answer Bank:

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<th>permutation</th>
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