

Precalc13.2

Solve permutation problems with repetitions
Solve circular permutation problems

permutation

repetition

circular

“ point of reference ”



$$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

$$1 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$

$$= 24$$

Applebees

The number of permutations of n objects of which p are alike and q are alike is

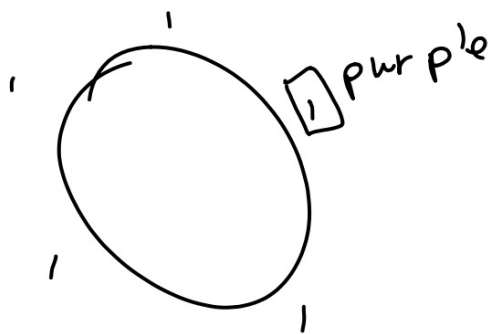
$$\frac{n!}{p! q!}$$

**Circular
Permutations**

If n objects are arranged in a circle, then there are $\frac{n!}{n}$ or $(n - 1)!$ permutations of the n objects around the circle.

If the circular object looks the same when it is turned over, such as a plain key ring, then the number of permutations must be divided by 2.

Point of reference:
one seat is by the door
one laptop is purple
one chair is by the window



5 4 3 2 1

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LET'S GET STARTED CHOOSE ANY 2 TO CREATE TODAY'S COMBO

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SOUPS

- New* · CHICKEN TORTILLA SOUP
- New* · FRENCH ONION SOUP
- TOMATO BASIL SOUP
- CHILI
- SOUP OF THE DAY

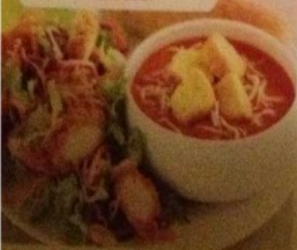
SALADS

- CAESAR
- ORIENTAL CHICKEN
- GRILLED SHRIMP 'N SPINACH
- FIESTA CHICKEN CHOPPED 🍷

ENTRÉES

- THREE-CHEESE CHICKEN PENNE
- CHICKEN FAJITA ROLLUP
- CLASSIC CLUBHOUSE GRILLE
- ROAST BEEF, BACON & MUSHROOM MELT
- New* · LEMON SHRIMP FETTUCCINE

ORIENTAL CHICKEN SALAD +
TOMATO BASIL SOUP



CLASSIC CLUBHOUSE GRILLE +
New FRENCH ONION SOUP



CAESAR SALAD +
New LEMON SHRIMP FETTUCCINE



$$5.4 = 20$$

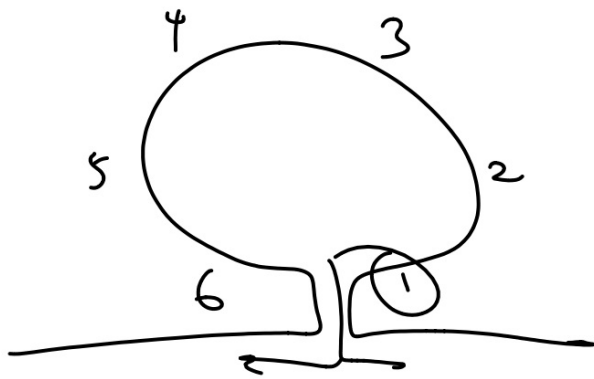
$$5.5 = 25$$

$$4.9 = 20$$

$$65$$

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6.5.4.3.2.1

~~7~~ 7 6 5 4 3 2 1

