Warm-up

1) How many ways can Evan order from 4 appetizers, 8 entrees and 5 desserts, if he chooses one of each?

F.C.P.

$$4 \cdot 8 \cdot 5 =$$

160

2) How many ways can Shannon pick 5 movies from 12 she likes for a road trip?

$_{12}C_5$

792

4) How many ways can Evan order from 4 appetizers, 8 entrees and 5 desserts, if he chooses one appetizer, 3 entrees and 2 desserts?

$$\frac{.4}{_4C_1} \cdot \ _8C_3 \cdot \ _5C_2 = \quad \textcolor{red}{\textbf{2,240}}$$

5) How many ways can Shannon pick the order to watch 5 movies from 12 she likes for a road trip?

$$_{12}P_5 = \quad \textcolor{red}{\textbf{95,040}}$$
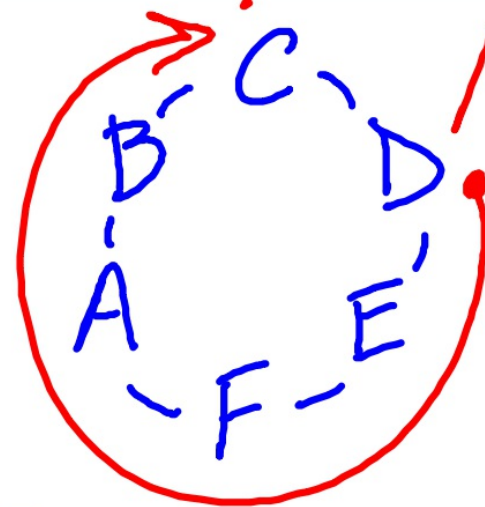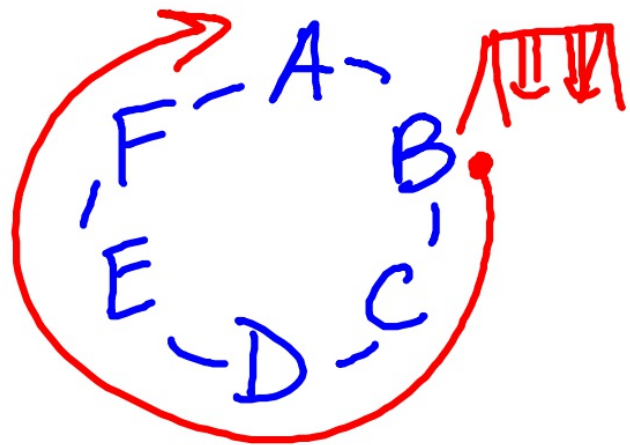
Circular Permutations

1) Circular arrangement

2) No Reference Point

How many distinct arrangements can 6 children be seated on a merry-go-round? with one seat by the swings?

$$\frac{n!}{n}$$
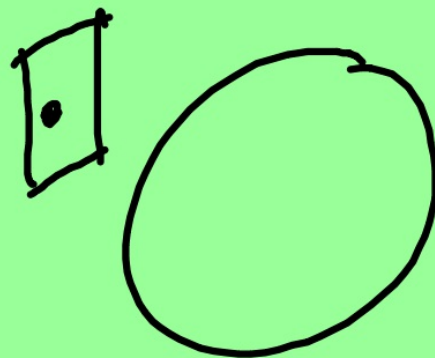
$$\frac{6!}{6} = \boxed{120}$$

Reference Point

$$6! = \boxed{720}$$

If there is a reference point then it is no longer a circular permutation (configuration is not the only factor).

Ex. 9 people are sitting around a circular table with one sitting closest to the door.

Ref

$9! = \boxed{362,880}$

Determine whether each arrangement of objects is a linear or circular permutation.

4) 6 houses on a cul-de-sac relative to the incoming street

Linear $6!$

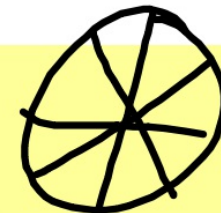6) a waiter placing 9 drinks along the edge of a circular tray

Circular $\dfrac{9!}{9}$

8) 20 wooden dowels used as spokes for a wagon wheel

Circular $\dfrac{20!}{20}$

10) 25 sections of a circular stadium relative to the main entrance

Linear $25!$

Assignment:

Complete WS 104

When you finish get a practice test from me

Determine whether each situation involves a permutation or a combination AND then find the number of possibilities.

1. Selecting a 4-person bobsled team from a group of 9 athletes

$$_9C_4$$

2. An arrangement of the letters in the word "Canada" $\dfrac{6!}{(3!)}$

P

3. Arranging 4 charms on a bracelet that has a clasp

P $4! =$

4. Selecting 3 desserts from 10 desserts that are displayed on a dessert cart

$$_{10}C_3$$

5. An arrangement of the letters in the word "annually" $\dfrac{8!}{(2!2!2!)} = \boxed{5,040}$

P

6. Circling 8 desks for a conference $\dfrac{8!}{8}$

P

7. Planting 3 red, a yellow, 2 white and a pink rose bush in a row $\dfrac{7!}{(3!2!)}$ $\boxed{14,400}$

P

8. Seating 5 men and 5 women alternately in a row, beginning with a woman

$$_5P_5 \cdot {_5P_5} = 5 \cdot 5 \cdot 4 \cdot 4 \cdot 3 \cdot 3 \cdot 2 \cdot 2 \cdot 1 \cdot 1 =$$

9. There are 8 male and 11 female employees at a company. How many different ways could they be selected to form a committee of 5 with 3 men and 2 women on it?

$$_8C_3 \cdot {_{11}C_2} =$$