

## Factorials and permutations

There are 5 chairs and 5 kids in the room. In how many ways can kids sit on these chairs?



The first kid can choose any chair. The second kid can choose any of the 4 remaining chairs, the third child has a choice between the three chairs, and so on. Therefore, there are  $5 \times 4 \times 3 \times 2 \times 1$  ways how all of them can choose their places.

The expression  $5 \times 4 \times 3 \times 2 \times 1$ , can be written as  $5!$  (5 factorial)

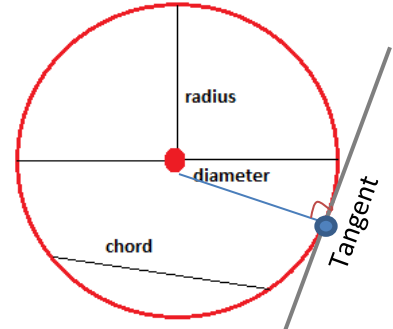
$$5 \times 4 \times 3 \times 2 \times 1 = 5! \quad \text{or} \quad n \times (n - 1) \times (n - 2) \times \dots \times 3 \times 2 \times 1 = n!$$

## Geometry.

What is the definition of a circle?

$$\text{Circumference} = 2\pi r$$

$$\frac{\text{Circumference}}{\text{Diameter}} = \pi$$



- The FULL CIRCLE forms a **360 degree** angle.
- A half circle or a straight angle is 180 degrees
- A fourth of a circle or a right angle is 90 degrees.

