Math 4. Handout #20

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Factorials and permutations

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

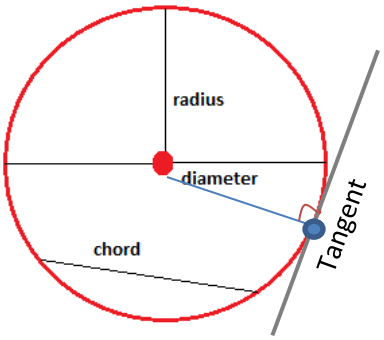
The first kid can choose any chair. The second kid can choose any of the 4 remaining chairs, the third child has a choice between the three chairs, and so on. Therefore, there are $5 \times 4 \times 3 \times 2 \times 1$ ways how all of them can choose their places.

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

$$5 \times 4 \times 3 \times 2 \times 1 = 5! \quad or \quad n \times (n-1) \times (n-2) \times \ldots \times 3 \times 2 \times 1 = n!$$

Geometry.

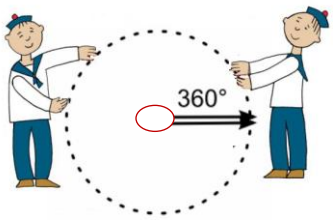
What is the definition of a circle?

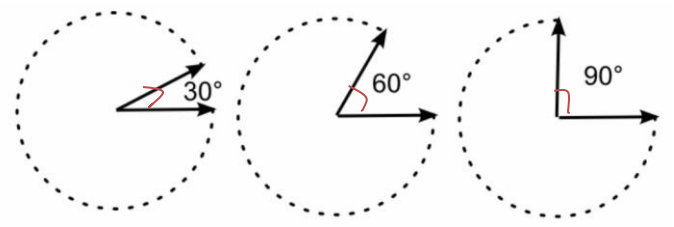


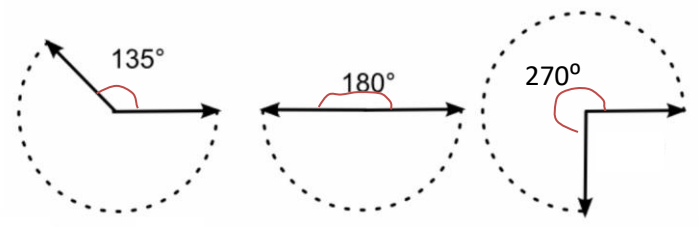
Circumference= $2\pi r$

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

- 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.




30°
60°
90°


135°
180°
270°