

Answer on Question #81427 – Math – Algebra

Question

10 people are seating on chairs around a circular table. These chairs are marked in a clockwise manner. There is a ball on the man's hand who is seated on 0 marked chair, and the ball will be passed from one man to another in clockwise manner.

In first step, the ball goes to 1 marked chair with 1 turn.

In second step, from there, the ball goes to 5 marked chair with 2^2 turns.

In third step, the ball goes to 2 marked chair by 3^3 turns from 5 marked chair.

By this means, in which chair the ball will be in 2017^{th} step?

Solution

Write expressions for the first three turns:

$$0 + 1^2 \cdot 10 + 1 = 11,$$

$$1 + 2^2 \cdot 10 + 4 = 45,$$

$$5 + 3^2 \cdot 10 + 7 = 102,$$

$$2 + 4^2 \cdot 10 + 10 = 172,$$

[this problem must be solved by programming]

$$0 + 2016^2 \cdot 10 + 6046 = 40648606,$$

$$6 + 2017^2 \cdot 10 + 6049 = 40688945.$$

There is a pattern: the first term of the expression is the last number of the previous expression's answer, n^2 – numbers of turns, 10 – quantity of chairs, the last term – term of arithmetic progression with the first term 1 and difference 3.

On the 2017^{th} turn the ball will be in the hands of the man sitting on the chair **5**.

Answer:

5