

Activity 3

Arithmetic Progression

Objective

To verify that the sum of first n natural numbers is $\frac{n(n+1)}{2}$.

Pre-requisite knowledge

- 1. Natural number system
- 2. Area of square and rectangle

Procedure

Let us consider the sum of our first natural numbers. Here $n = 10$ and $r = 1$.

- 1. Take a square paper.
- 2. On the left side, draw a horizontal line mark of length 10 cm.
- 3. With the help of a ruler, draw a vertical line of length 10 cm and of

Observations

The shaded area is one half of the whole square paper taken. To see this, cut the shaded portion and place it on the remaining part of the grid. The student will observe that it completely covers the remaining part of the grid.

Area of the whole square = $10 \times 10 = 100$
Area of the shaded portion = $\frac{1}{2} \times 10 \times 10 = 50$
This verifies that, $S_n = \frac{n(n+1)}{2}$
i.e. $S_{10} = \frac{10(10+1)}{2} = 55$

The same verification can be done for any other value of n .

Learning outcome

Students develop a general formula for the sum of natural numbers starting from one.

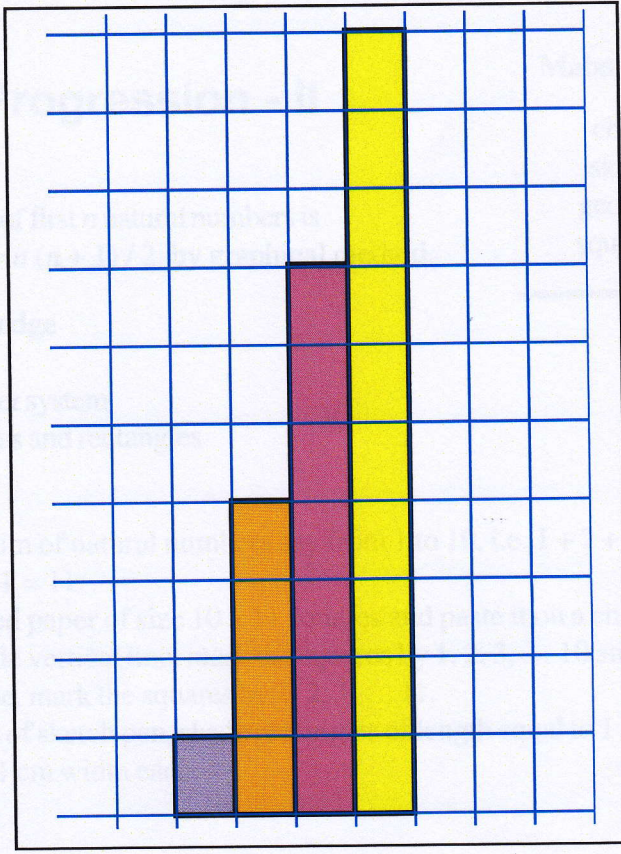


Fig 2(a)

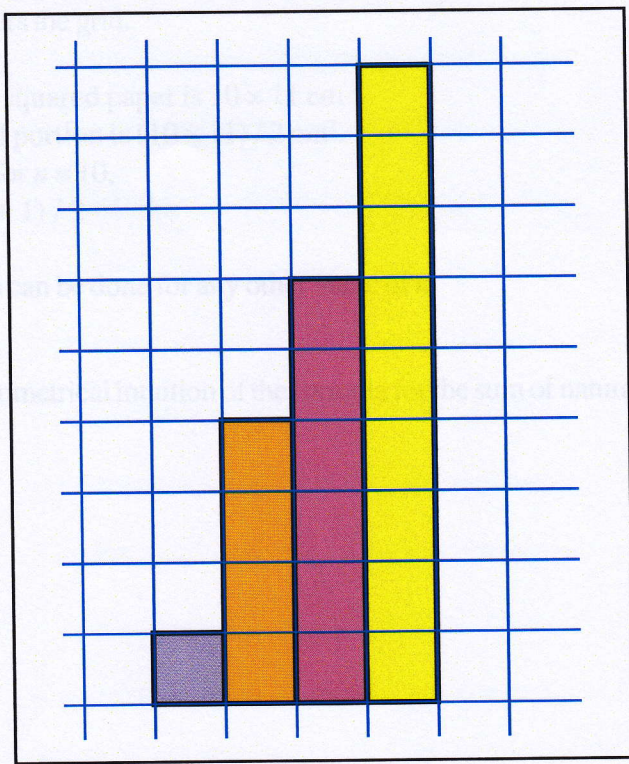


Fig 2(b)