

ACTIVITY NO. - 2

Subject	MATHEMATICS
Class	XII
Chapter/Unit	Relation and function
Topic	One-one onto function
Time	40 min
Nature of Activity	Individual

What will I learn (Learning Outcome)?

To demonstrate a function which is not one-one but is onto.

Skills: Visualizing, Creating, Accuracy, Precision

What do I require?

Hardboard, some pieces of threads, pins, white thick sheets of paper, pencils, colours, a pair of scissors coloured paper, sketch pens, geometry box, glue stick,

What I have to do?

Take the set $A = \{a, b, c, d, e\}$ Take the set $B = \{1, 2, 3\}$ Join (correspondence) elements of A to the elements of B as shown in Fig. 2.3

What do I need to know?

Knowledge of sets, relation and function

➤ Teacher's Activity

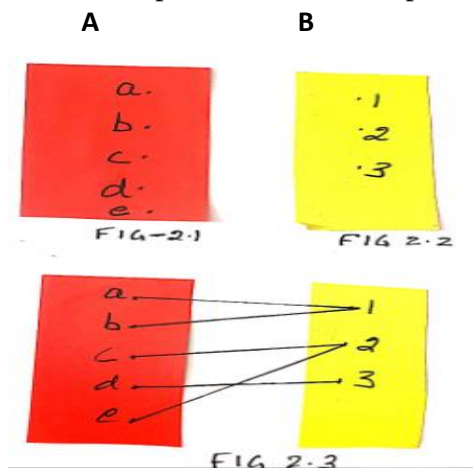
Teacher will discuss one -one, many-one, onto and not onto function with students

How will I proceed?

➤ Student's Activity

Student will

1. Take a coloured strip and Paste it on the left-hand side of the board and fix five pins on it as shown in the Fig.2.1. Name the pins on the strip as **a, b, c, d, and e**
2. Take another coloured strip and Paste it on the right-hand side of the cardboard and fix three pins on it. The coloured strip as shown in Fig.2.2. Name the pins on the strip as **1, 2 and 3.**
3. Join pins on the left strip to the pins on the right strip as shown in Fig. 2.3.



What have I observed?

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S.NO	From Fig 2.1, 2.2, 2.3	
1	The image of the element a of A in B is	-----
2	The image of the element b of A in B is	-----
3	The image of the element c of A in B is _____.	-----
4	The image of the element d of A in B is _____.	-----
5	The image of the element e of A in B is _____.	-----
6	So, Fig. 2.3 represents a _____	(one-one/not one-one).
7	Every element in A has a _____ image in B So, the function is _____	(one-one/not one-one).
8	The pre-image of each element of B in A _____	(exists/does not exist).
	So, the function is _____	(onto/not onto)

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What have I learnt?

A function which is not one-one but is onto can be demonstrated in the above manner.

What am I curious to learn?

The same activity can be done by changing the number of the elements of the sets A and B , also a function which is one-one but not onto.

Let me evaluate myself

Q1. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \frac{1}{x} \quad \forall x \in \mathbb{R}$. Then f is

- (a) one-one (b) onto (c) bijective (d) f is not defined

Q2 Which of the following functions from $\mathbb{Z}$ into $\mathbb{Z}$ are bijections?

(a) $f(x) = x^3$ (b) $f(x) = x + 2$ (c) $f(x) = 2x + 1$ (d) $f(x) = x^2 + 1$

Q3 Give an example of a map (i) which is one-one but not onto (ii) which is not one-one but onto

(iii) which is neither one-one nor onto.

Q4. If $A = \{a, b, c, d\}$ and $f = \{a, b\}, (b, d), (c, a), (d, c)\}$, show that f is one-one from A onto A . Find f^{-1} .

Q 5. Let N be the set of natural numbers and the function $f: N \rightarrow N$ be defined by

$f(n) = 2n + 3 \forall n \in N$. Then f is

(a) surjective

(b) injective

(c) bijective

(d) none of these
