bijective funct^n }

$X = \{ F : X \to X \mid f \text{ is bijective } f^n \}$

To Check is Compositn operatn on this set Group or not?

Chek → closure

Asso.

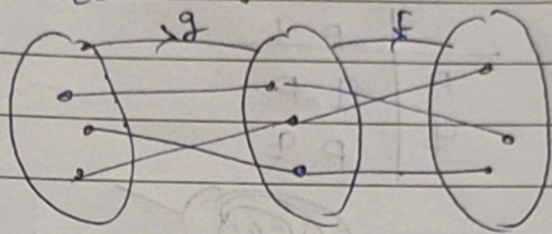
Identity

Inverse

Compositn fog

1) Closure

Let fog



as both f & g both are bijective.

∴ there Composition also.

∴ It will belong to X (set of all bijective f^n)

2) Associative

by property of Composition

$f\circ(g\circ h) = (f\circ g)\circ h$

3) Identity

let T be f^n s.t. $T(X) = X$

∴ $F\circ T(X) = T\circ f(X) = f(X)$

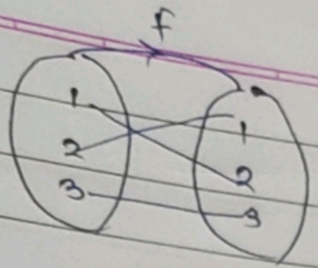
explain

$F\circ T(X) = F(T(X)) = F(X)$

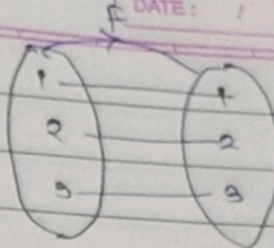
$T\circ f(X) = T(f(X)) = F(X)$

graphically

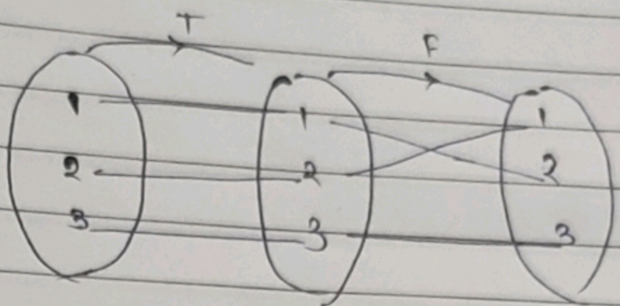
let $F(1) = 2$ $f(2) = 1$ $F(3) = 3$



let T =



$f \circ T(x)$



$\Downarrow$

~~4) inverse~~

$\equiv f(x)$

sim. $T \circ f(x)$

4) inverse as f is bijective $\therefore$ f^{-1} exist.

$\therefore$ $\forall f \in Y$ f^{-1} exist

$\therefore$ Group