Definition of A Function A function from set A to a set B is a subset of A×B so that for every XEA, there exists peractly one yEB so that (X,y)ef Each x in the domain has exactly one image under f. V: IR-> IR defined by Tx=a where a<sup>2</sup>=x, and a ≥0  $[J: IR \rightarrow Z$  defined by LxJ = an integer n needs that  $N \leq X \leq n + 1$  $f=g \iff f$  and g have the same domain and for every x in the domain, f(x) = g(x)arrow diagram: 1 2 3 4 4 6 B 0 NIY ONE arrow from Set A One to One Functions: Contrupostive definition: f. 17->13 is one-to-one Vx, y EA, if fixs=figs than x=y IAI = IBI => If: A>B so that

Everything in the co-domain gets hit. There evers $f(A \rightarrow B)$ is onto $\iff$ type B, fixed, for the first $(A \rightarrow B)$ is onto $\implies$ type B, fixed, for the first onto $Ut \ A = \{1, 2, 3, 4\}, 13 \in \{1, 2, 4, 5\}, f \in \{(1, 1)(2, 2)(3, 3)(4, 4)\}\ ib\ a\ 1 \neq 1\ $ function $A \rightarrow B, f \in \{(1, 2)(2, 3)(3, 4)(4, 5)\}$ How many functions are there from $A \rightarrow B$ ? $5 \times 4 \times 3 \times 2$	. (	)^-	-te	2	fur	vit	ior	<u>\</u>	•	•	•	•	•	0	•	•	•	•	•	•	•
$f_{A \rightarrow B} \Rightarrow onto \Leftrightarrow \forall y \in B, \exists x \in A, f \in x_{1} = y.$ $ A  \ge  B  \Leftrightarrow \exists f: A \rightarrow B \text{ so that } f \text{ is onto}$ $Ut A = \{1, 2, 3, 4\}, [3 : \{1, 2, 4, 5\}, f = \{(1, 1)(2, 2)(3, 3)(4, 4)\} \text{ is a } 1 = 1 \text{ function}$ $A \rightarrow B.$ $f = \{(1, 2)(2, 3)(3, 4)(4, 5)\}$ How many functions are there from $A \rightarrow B$ ? $\exists x 4 \times 3 \times 2$	Everything in the Co-domain gets hit.															•					
$[A] \ge [B] \iff \exists f: A \Rightarrow B \text{ so that } f \text{ is onto}$ $[Ut A = \{1, 2, 3, 4\}, B \in \{1, 2, 4, 5\}, f = \{(1, 1)(2, 2)(3, 3)(4, 4)\} \text{ is a } 1 \neq 1 \text{ function}, A \Rightarrow B, f = \{(1, 2)(2, 3)(3, 4)(4, 5)\}, f = \{1, 2)(2, 3)(3, 4)(4, 5)\}, f = \{1, 2, 3, 4, 5\}, f = \{1, 2, 3, 5\}, f = \{1, 3, 5\},$	f.A->B is onto > tyeb, Jxen, fcx)=y.															•	•				
Let $A = \{1, 2, 3, 4\}$ , $B \in \{1, 2, 4, 5\}$ , $f = \{(1, 1)(2, 2)(3, 5)(4, 4)\}$ is a 1+01 function $A \rightarrow B$ . $f = \{(1, 2)(2, 3)(3, 4)(4, 5)\}$ How many functions are there from $A \rightarrow B$ ? $5 \times 4 \times 5 \times 2$	•	•	•	-11 -	917	1B	⇐	÷ ج	f:	A-	<b>3</b> 3	<b>,</b> Sc	s. +1	urt	. <b>f</b>	i5	on	to	•	•	•
$f = \{(1,1)(2,2)(3,3)(4,4)\} \text{ is a } 1 \neq 1 \text{ function} \\ A \rightarrow B. \\ f = \{(1,2)(2,3)(3,4)(4,5)\} \\ How many functions are there from A \rightarrow B? \\ 5 \times 4 \times 5 \times 2$	le	ł.	A	= {	1,2,	3,0	13	, 13			2.,4	1,5	}. ,	•	•	•	•	0	0	•	0
A->B. f=[(1,2)(2,3)(3,4)(4,5)] How many functions are there from A->B? 5×4×3×2	•	•	f=	{(		(2,	z)(	3,3	)(1	ર, વ	)}	is	a		-0 1	•	fire	tio		•	•
How many functions are there from A=8? 5×4×3×2		•	A f=	-> {(1	B. 2)	(2	,3)	(3,	4)	(4,9	<u>ত্</u> য	•	•	•	•	•	•	•	•	•	
$5 \times 4 \times 5 \times 2$	•	Ha	N.	mo	Mg	for	rcti	ons	. 0	nre		her	e	.£	om	•	A-	>B	?	•	•
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