Name ....

row .... col....

1.	2.	3.	4.	$\sum$

1. For $(a.b)(c,d) \in \mathbb{N}^2$ let $(a,b) \preceq (c,d) \Leftrightarrow a \geq c \wedge a+b \leq c+d$. Prove, that $\preceq$ is partial order. Draw a Hasse diagram of $P = (\{(a,b) : a,b \in \{1,2,3,4\}\}, \preceq)$. Find minimal, maximal, largest, smallest elements if they exist in P. Find $\inf((2,1),(3,2)) =$ ....., $\sup((2,1),(3,2)) =$ .....,

2. For $x, y \in \mathbb{N}$ $xLy \Leftrightarrow x$ is the largest even divisor of y. Is relations L a function? Is it one-to-one function? What is the domain of L. Explain your answer.

3. Let $f : \mathbb{R}^2 \to \mathbb{R}$, $f(x, y) = (x - 1)(y - 1)(x^2 + y^2 - 4)$. Find $f(\mathbb{R}^2)$ and $f^{-1}([0, \infty))$.

4. Prove by definition that set of odd integers is equipollent with the set of natural numbers divisible by 3.