Name ....

row .... col....

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

1. For $x, y \in \mathbb{R}^+$ let $x \sim y \Leftrightarrow \exists q \in \mathbb{Q}\ x = q \cdot y$. Prove $\sim$ is equivalence relation and find equivalence classes.

2. For $x, y \in \mathbb{N}$ let $x \preceq y \Leftrightarrow x + 2 \leq y \vee x = y$. Prove, that $\preceq$ is partial order. Draw a Hasse diagram of $P = (\{1..9, 13\}, \preceq)$. Find minimal, maximal, largest, smallest elements if they exist in P. Find $\inf(3,4) =$ ....., $\sup(3,4) =$ .....,

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

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

Name .... row .... col....

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

1. For $x, y \in \mathbb{R}$ let $x \sim y \Leftrightarrow \exists n \in \mathbb{Z}\ x = n + y$. Prove $\sim$ is equivalence relation and find equivalence classes.
2. For $x, y \in \mathbb{N}$ let $x \preceq y \Leftrightarrow 2x \leq y \vee x = y$. Prove, that $\preceq$ is partial order. Draw a Hasse diagram of $P = (\{1..10\}, \preceq)$. Find minimal, maximal, largest, smallest elements if they exist in P, Find $\inf(3,4) =$ ....., $\sup(3,4) =$ .....,
3. For $x, y \in \mathbb{N}$ $xLy \Leftrightarrow x$ is the smallest even divisor of y. Is relations L a function? Is it one-to-one function? Explain your answer.
4. Let $f : \mathbb{R}^2 \to \mathbb{R}$, $f(x, y) = (xy)^2$. Find $f(A)$ and $f^{-1}(f(A))$ for $A = [-1, 2] \times [1, 2]$.