

Instructions

- Answer each question completely; justify your answers.
 - This assignment is due at 9:00 am on October 25, 2001.
1. Let $A = \mathbb{N}$ and define \preceq on A by $a \preceq b$ iff a divides b .
 - (a) Show that (A, \preceq) is a poset.
 - (b) Is the poset totally ordered?
 - (c) Does this poset have a maximum?
 - (d) Does this poset have a minimum?
 2. Let $A = \{2, 3, 4, \dots, 17\}$ and define \preceq on A by $a \preceq b$ iff a divides b .
 - (a) Draw the Hasse diagram for the poset (A, \preceq) .
 - (b) Is \preceq a total order?
 - (c) Does this poset have a maximum?
 - (d) Does this poset have a minimum?
 - (e) Does this poset have any minimal elements? If yes, what are they?
 - (f) Does this poset have any maximal elements? If yes, what are they?
 - (g) What is the least upper bound of elements 3 and 4?
 - (h) What is the greatest lower bound of elements 15 and 16?
 3. Let $A = \mathbb{R}^2$ and define \preceq on A by $(a, b) \preceq (x, y)$ iff $a \leq x$ and $b \leq y$.
 - (a) Show that (A, \preceq) is a poset.
 - (b) Is the poset totally ordered?
 - (c) What is the least upper bound on $(\sqrt{2}, 9)$ and $(5, -3)$?
 - (d) What is the greatest lower bound on $(\pi, \frac{2}{3})$ and $(0, \frac{3}{2})$?
 4. Exercise 2R.15.