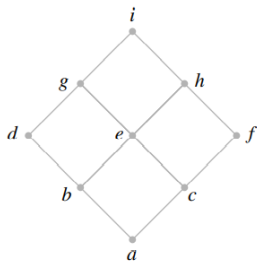
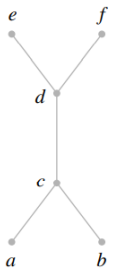
Exercise 2

In exercises 1 through 6, determine whether the Hasse diagram represents a lattice.

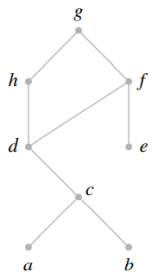
1.



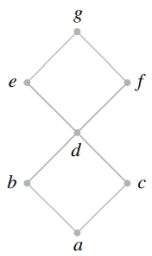
2.



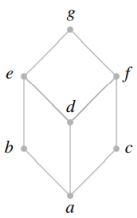
3.



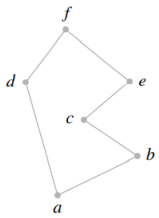
4.



5.



6.



7. Is the poset A = {2, 3, 6, 12, 24, 36, 72} under the relation of divisibility a lattice?

8. Let $L = P(S)$ be the lattice of all subsets of a set S under the relation of containment. Let T be a subset of S. Show that $P(T)$ is a sublattice of L.

9. Show that for any a, b, c in a lattice if

$a \wedge (b \vee c) = (a \wedge b) \vee (a \wedge c)$ then

$a \vee (b \wedge c) = (a \vee b) \wedge (a \vee c)$

10. Let $(L, \preccurlyeq)$ be a distributive lattice. Show that for $\forall a, b, c \in L$, if

$a \wedge b = a \wedge c$ and $a \vee b = a \vee c$ then

$b=c$

11. Find the complement of each element in D_{42}.

12. In the following figures, determine whether each lattice is distributive, complemented, or both.