CSCI 1900 - Homework 17 - B

**Section 7.1: Introduction to Trees;** *(18)*

For each of the problems 1 – 4, a relation *R* is defined of a set *A*. For each problem,

* Draw the graph of *R*
* Determine if the relation *R* is a tree,
* If *R* is a tree, give the root.

1. *A* = { 1, 2, 3, 4, 5 } (3)  
   *R* = { (1,2), (1,3) (2,5), (3,4), (4,2) }
2. *A* = { a, b, c, d, e, f } (3)  
   *R* = { (b,a), (c,d), (e,b), (f,e) }
3. *A* = { 1, 2, 3, 4, 5, 6 } (3)  
   *R* = { (1,2), (1,3), (2,3) (4,1), (4,5), (4,6) }
4. *A* = { a, b, c, d, e, f } (3)  
   *R* = { (a,b), (a,d), (b,c) (d,f), (e,d) }
5. Answer the following by referring to the above tree. (6)
   1. Which vertex is the root?
   2. What is the height of the tree?
   3. List the vertices at level 3.
   4. List the leaves.
   5. List the descendants of v1.
   6. List the siblings of v1?