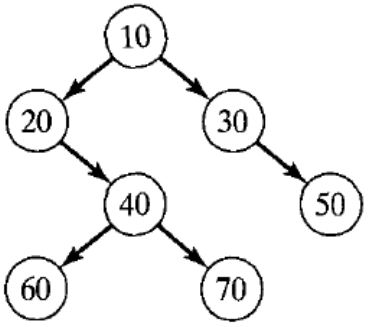
CST 370
Homework (Sorting and Trees)

1. (**25 points**) Consider the unsorted array: 92, 81, 73, 44, 35, 56, 89, 68. Imagine that you run a sorting algorithm on the array, and at some moment in time, the array is ordered as: 81, 92, 73, 44, 35, 56, 68, 89. Which of the following sorting algorithms may have been running? Explain your answer.

    - Quicksort (1st item as pivot)
    - Mergesort
    - Insertion sort
    - Selection sort

2. (**25 points**) Consider the following unsorted arrays of numbers: 5, 8, 3, 7, 9. Obtain the numbers in sorted order (descending) by applying the **quick sort algorithm**. You are required to outline each step of the algorithm (i.e., show the state of the list after each iteration of the algorithm). Assume that the first element is always picked as the "pivot".

3. (**25 points**) Is the following tree a binary tree? If so, is it a binary search tree? Explain your answer.



4. (**25 points**) Is the following tree a binary search tree? Explain your answer.