1.

2. The height of the tree is 7

3.

a. Pre order:

74 12 36 61 47 217 77 153 93 121 146 286 248 337 463

b. In order:

12 36 47 61 74 77 93 121 146 153 217 248 286 337 463

c. Post order:

47 61 36 12 146 121 93 153 77 248 463 337 286 217 74

5. Successor(146): 153

6. Predecessor(146): 121

7.

Search for 337: 74 217 286 337

Search for 47: 74 12 36 61 47

8.

9.

121 61 36 12 47 77 74 93 248 153 146 217 337 286 463

4.

If you know you need to explore the roots before inspecting any leaves, you pick pre-order because you will encounter all the roots before all of the leaves.

If you know you need to explore all the leaves before any nodes, you select post-order because you don't waste any time inspecting roots in search for leaves.

If you know that the tree has an inherent sequence in the nodes, and you want to flatten the tree back into its original sequence, than an in-order traversal should be used. The tree would be flattened in the same way it was created. A pre-order or post-order traversal might not unwind the tree back into the sequence which was used to create it.