1. The expected space used by a skip list with \( n \) elements is \( \Theta(n) \), and the expected time to search for an element in a skip list is \( \Theta(\log n) \), which is asymptotically \(<\) (one of \(<\, =\, >\) than the worst-case time for searching in a binary search tree.

2. Consider a binary search tree \( T \) storing \( n \) (key, value) pairs, and let \( h \) denote the height of \( T \). In the best case, \( h \) is \( \Theta(\log n) \) and in the worst case, \( h \) is \( \Theta(n) \) (use asymptotic notation).

3. Consider a binary search tree \( T \) storing \( n \) (key, value) pairs, and let \( h \) denote the height of \( T \). The time for a \texttt{find}(\( k \)) operation is \( \Theta(h) \) and the time for a \texttt{put}(\( k, v \)) operation is \( \Theta(h) \).

4. Draw a binary search tree that would result from inserting the following items in this order (assuming the key and value are the same): 10, 20, 30, 40.

```
    20
   /   \
10    30
   \   /   \
    \30
```

5. Consider an AVL tree \( T \) storing \( n \) (key, value) pairs, and let \( h \) denote the height of \( T \). In the best case, \( h \) is \( \Theta(\log n) \) and in the worst \( h \) is \( \Theta(n) \) (use asymptotic notation).

6. Consider an AVL tree \( T \) storing \( n \) (key, value) pairs. The time for a \texttt{find}(\( k \)) operation is \( \Theta(\log n) \) and the time for a \texttt{put}(\( k, v \)) operation is \( \Theta(\log n) \).

7. Draw an AVL tree that would result from inserting the following items in this order (assuming the key and value are the same): 10, 20, 30, 40.

```
    20
   /   \
10    30
   \   /   \
    \30
   /   /   \
```

```