1. Backtracking searched the tree in depth-first order from "left" to "right." In the "general" state-space tree below number the tree nodes with the Backtracking order.

2. Why might we do better to first follow branches of the tree that we think might lead to the best solution?

3. In the *Best-First search with Branch-and-Bound* (chapter 6) approach:
   - does not limit us to any particular search pattern in the state-space tree
   - calculates a "bound" estimate for each node that indicates the "best" possible solution that could be obtained from any node in the subtree rooted at that node, i.e., how "promising" following that node might be
   - expands the most promising node first by visiting its children
For example, the 0-1 Knapsack problem can use the Fractional Knapsack calculation to "bound" the best possible solution in the subtree.

a) Complete the state-space tree for the following 0-1 Knapsack problem instance with four items and a knapsack weight limit of $W=10$ oz. Indicate the order in which the nodes are expanded.

b) "Problems" with Best-First search with Branch-and-Bound (chapter 6) approach:
• we must store information about each node waiting to be expanded (backtracking kept a single, global state)
• we need to find the "best" node to expand
What data structure would aid in finding the "best" node to expand?