6.5-1.

Illustrate the operation of Heap-Extract-Max on the heap $A = \langle 15, 13, 9, 5, 12, 8, 7, 4, 0, 6, 2, 1 \rangle$.

Answer.

Figure 1 shows the operation of Heap-Extract-Max on the heap $A = \langle 15, 13, 9, 5, 12, 8, 7, 4, 0, 6, 2, 1 \rangle$.
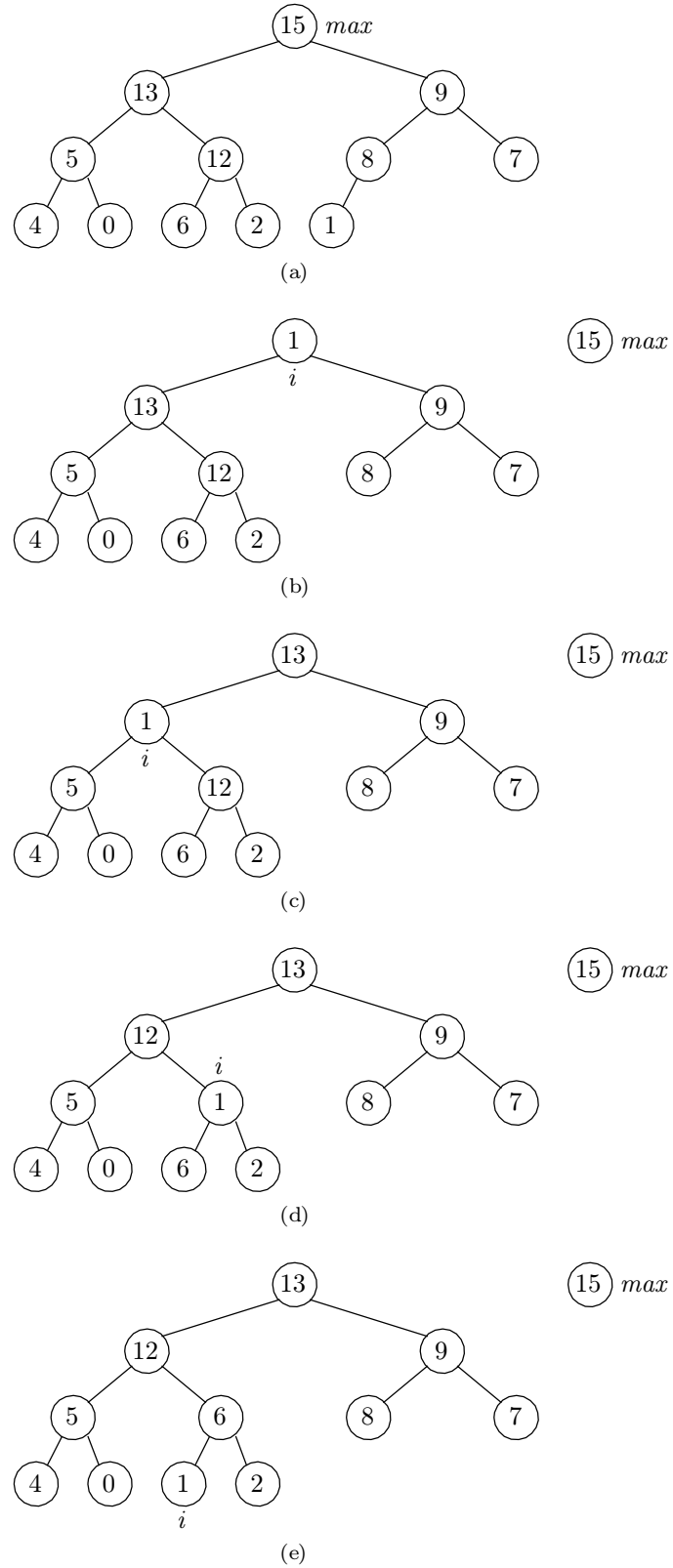
Figure 1. The operation of HEAP-EXTRACT-MAX. **(a)** The max-heap $A = \langle 15, 13, 9, 5, 12, 8, 7, 4, 0, 6, 2, 1 \rangle$ with the node of largest key 15 on the top. **(b)** This node was eliminated with its position occupied by the last node of the heap. **(c)–(d)** The process of applying MAX-HEAPIFY$(A, 1)$ in line 6. **(e)** After the call to MAX-HEAPIFY, the max-heap property now holds and the procedure terminates with the node of largest key 15 returned.