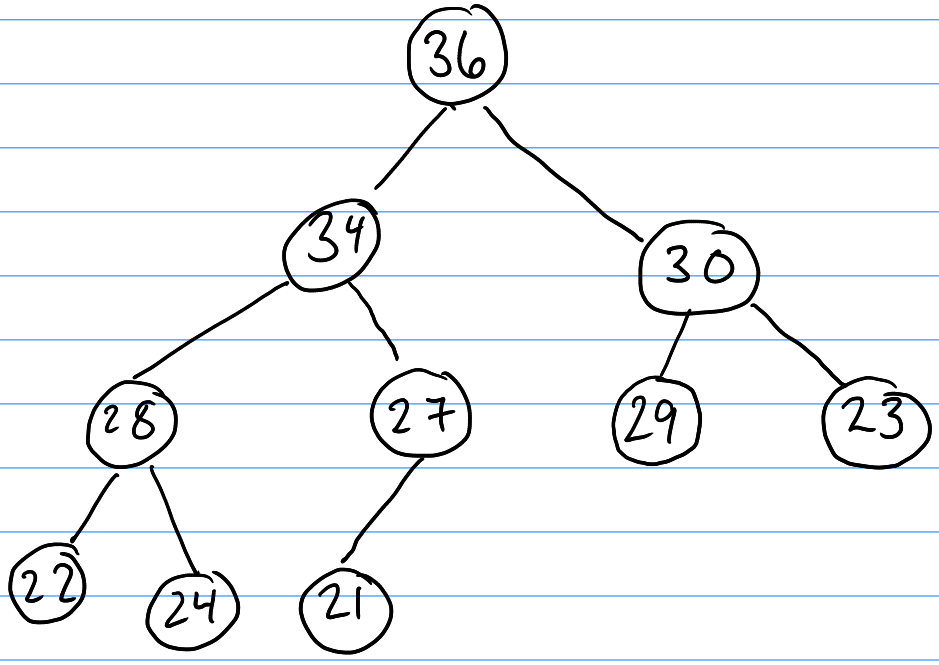
Heap Exercises

1) You want to sort an array with HeapSort. Calculate the amount of work (Θ-bound) for

a. $A = [1, 2, 3, \ldots, n]$
b. $A = [n, n-1, n-2, \ldots, 1]$
c. A containing n distinct elements
d. A containing n identical elements

Pick some small n and trace the algorithm and see if you can find the pattern.

2) Starting with the Max heap



Trace what happens when you call

a. Heap-Insert (A, 30)
b. Heap-Insert (A, 40)
c. Heap-Increase-key (A, 8, 35)
d. Heap-Increase-key (A, 6, 38)
e. Extract-Max (A)

For each sub-exercise, draw any paths the vertices take and the final Max-heap.