Master Method

Let T(n) be a monotonically increasing function (a function that is increasing and non-decreasing).

If the recurrence is of the form $T(n) = aT(n/b) + \Theta(n^k log^p n)$, given $a \geq 1, b > 1, k \geq 0$ and p is a real number, then the complexity is defined as:

1) If $a > b^k$, then $T(n) = \Theta(n^{log_b a})$

2) If $a = b^k$
   - a. If $p > -1$, then $T(n) = \Theta(n^{log_b a}(logn)^{p+1})$
   - b. If $p = -1$, then $T(n) = \Theta(n^{log_b a} loglogn)$
   - c. If $p < -1$, then $T(n) = \Theta(n^{(log_b a})$

3) If $a < b^k$
   - a. If $p \geq 0$, then $T(n) = \Theta(n^k log^p n)$
   - b. If $p < 0$, then $T(n) = O(n^k)$