"Master Theorem"

$$T(n) = \begin{cases} aT(n/b) + cn^d & n > 1 \\ f & n = 1 \end{cases}$$

implies

$$T(n) = \begin{cases} \left(f + \frac{c}{ab^{-d}-1}\right) n^{\log_b a} - \frac{cn^d}{ab^{-d}-1} = \begin{cases} \Theta(n^{\log_b a}) & a > b^d \\ \Theta(n^d) & a < b^d \end{cases} \\ n^d(f + c\log_b n) = \Theta(n^d \log_b n) & a = b^d \end{cases}.$$

`Summing solutions:` If

$$T(n) = \begin{cases} aT(n/b) + \sum c_i n^{d_i} & n > 1 \\ f & n = 1 \end{cases}$$

then we can just sum the solutions of each recurrence:

$$T_i(n) = \begin{cases} aT_i(n/b) + c_i n^{d_i} & n > 1 \\ 0 & n = 1 \end{cases}$$

and add in $fn^{\log_b a}$ for the contribution from the leaves.