

Master Theorem. For the recurrence $T(n) = aT(n/b) + cn^d$.
 If $a < b^d$: $T(n) \in O(n^d)$
 If $a = b^d$: $T(n) \in O(n^d \lg n)$
 If $a > b^d$: $T(n) \in O(n^{\log_b a})$

Geometric Series.

$$\sum_{i=0}^n r^i = \frac{1 - r^{n+1}}{1 - r}$$

$$\sum_{i=0}^{\infty} r^i = \frac{1}{1 - r}$$

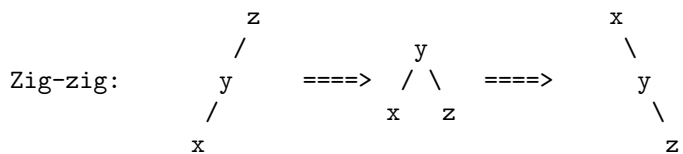
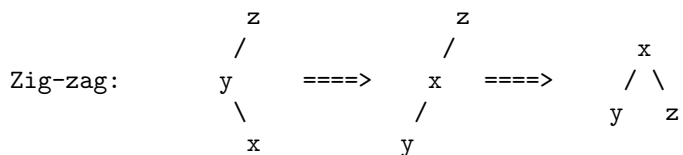
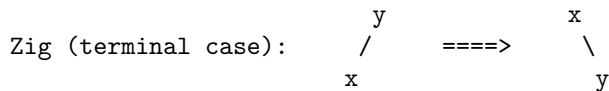
Stirling's Formulae.

$$\ln n! \approx n \ln n - n$$

$$n! \approx n^n e^{-n} \sqrt{2\pi n}$$

$$n! \approx \sqrt{2\pi n} n^{n+1/2} e^{-n}$$

Splay Tree Rotations.



Access Lemma. The number of primitive rotations to splay node x in a tree rooted at t is at most $3(r(t) - r(x)) + 1$, where $r(x)$ denotes *rank*, or the floor of the log base 2 of the subtree rooted at x .