

Unit 6: Asymptotic analysis and L'Hôpital's rule

Vocabulary and notation

\ll	\sim	much less than	asymptotically equal
asymptotic to	indeterminate form	much closer to	for sufficiently large x
annual yield	APY	growth factor	continuous compounding

Skills

- Be able to compute limiting ratios with L'Hôpital's rule
- Know when L'Hôpital's rule can be applied and when it cannot
- Know the variants of L'Hôpital's rule : one-sided, and L'Hôpital's rule at infinity,
- You do not need to know the so-called infinity rules, but it sometimes saves you time: recognize when a form is not really indeterminate and you can just substitute.
- Recognize when to take logs before applying L'Hôpital's rule .
- Recognize when to take reciprocals before applying L'Hôpital's rule .
- Know two rules for deducing $f \sim g$ when f and g are composed of simpler functions
- Know the basic scales of powers, exponentials and logarithms and how functions are ordered at infinity within and across these scales
- Compute annual yield or growth factor from interest rate, and *vice versa*