Cosmic Evolution

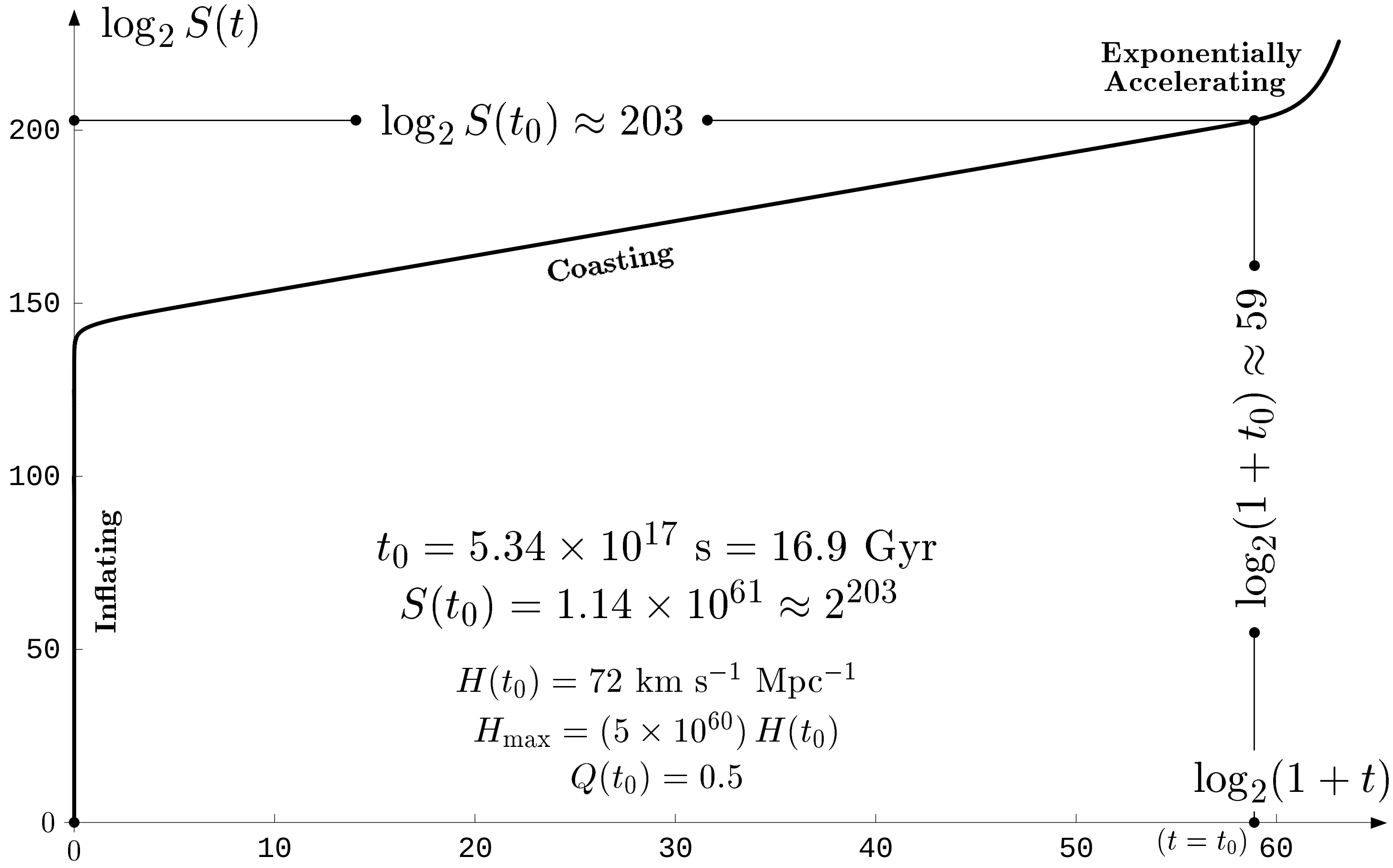

Figure 4: Graph of $\log_2 S(t)$ versus $\log_2(1 + t)$ for the sample solution of the Appendix. The early stage rapid inflation, after producing approximately 144 doublings of the normalized scale factor S in about one second, gives way to a long period of uphill 'coasting' (where the graph is nearly linear), followed by a return to exponential acceleration after $t = t_0$. In the coasting period $\log_2 S(t) \approx 144 + ((203-144)/(59-0)) \log_2(1+t) = 144 + \log_2(1+t)$, so $S(t) \approx 2^{144}(1 + t)$, making the expansion essentially linear with time.

- $S(t) = 1$ when $t = 0$ (time of the 'big bounce').
- $S(t) = 1.14 \times 10^{61}$ when $t = t_0$ (time of present epoch).
- $H =$ Hubble parameter $= \dfrac{\dot{S}}{S}$.
- $Q =$ acceleration parameter $= \dfrac{\ddot{S}/S}{(\dot{S}/S)^2}$.

Taken from Cosmic acceleration, inflation, dark matter, and dark 'energy' in one neat package, by H. G. Ellis.