

# Why Is There No Difference In Our Ages?

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Suppose your age is  $x_t$  and my age is  $y_t$  at some time  $t$ . Then in  $n$  years your age is  $x_t + n$  and my age is  $y_t + n$ . What this implies is that as time goes by (measured by  $n$ ), the difference in our ages vanishes!

Why? Consider that

$$\lim_{n \rightarrow \infty} \left[ \frac{x_t + n}{y_t + n} \right] = 1$$

which is another way of saying the same thing. This result is reassuring since it pretty much models our experience.

More generally consider the function  $f_a(n) = a + n$  where  $a, n \in \mathbb{N}$ . Then

$$\lim_{n \rightarrow \infty} \left[ \frac{f_a(n)}{f_b(n)} \right] = 1 \tag{1}$$

for  $a, b \in \mathbb{N}$ . We also write Equation 1 in the following alternate notation:

$$f_a(n) \sim f_b(n)$$

That is, the  $\sim$  symbol means that the ratio of its two arguments tends towards 1 as its arguments tend toward  $\infty$ .