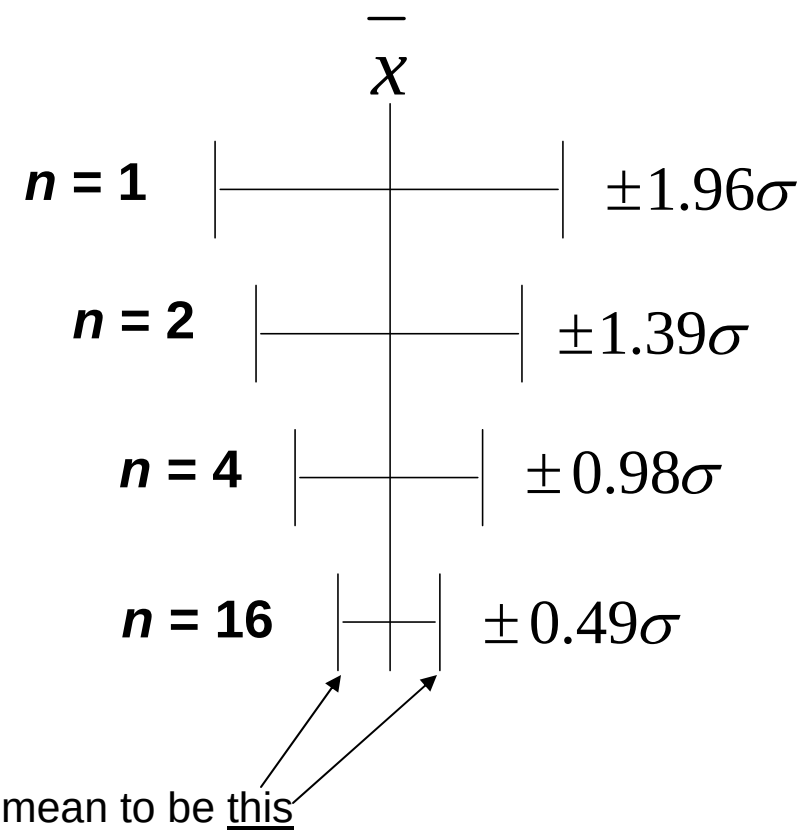
C. Confidence Intervals When σ is Known (Perfected Method)

(<u>not</u> calculated from the data on a sample; known from past experience)

$$\mu = \bar{x} \pm z\frac{\sigma}{\sqrt{n}}$$

The following CI's all have a 95% chance of containing the true value μ:



At the 95% CL, ***z* = 1.96**
<u>regardless of the value of n</u>

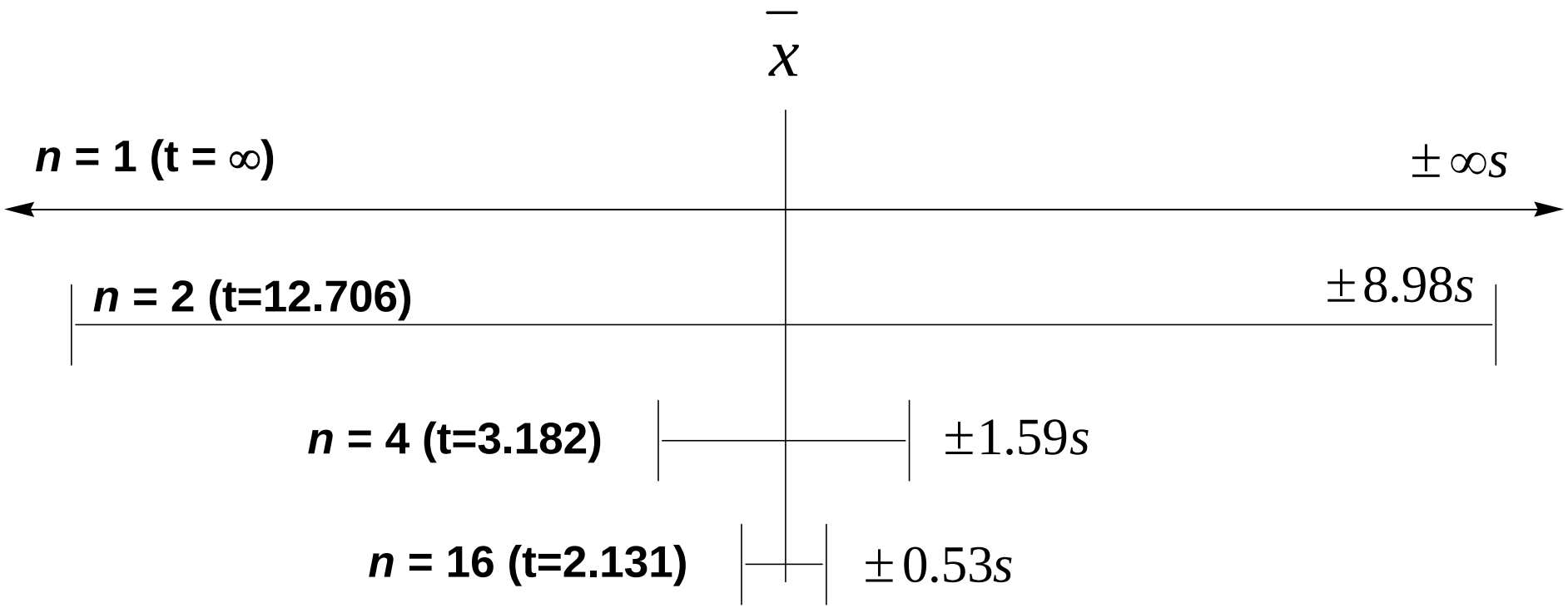
Random error can cause the mean to be <u>this</u> far away from the true value(!)

D. Confidence Intervals When σ is Not Known

(calculate an estimated *s* from the data on a sample)

$$\mu = \bar{x} \pm t\frac{s}{\sqrt{n}}$$

The following CI's all have a 95% chance of containing the true value μ:



t depends on both the confidence level and on the number of degrees of freedom (*n* – 1)