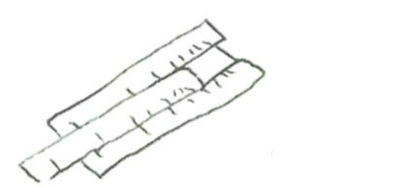
HOW-TO SLIDERULES



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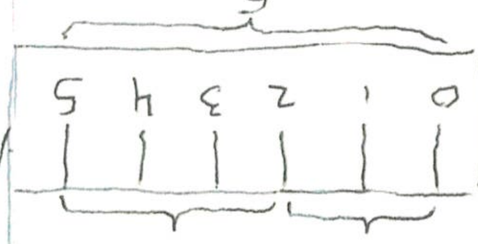
You've likely heard of sliderules. Do you know how they work?

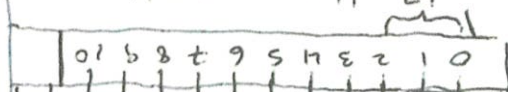
One way to model addition is to add physical distances.

$2 + 3 =$



For two offset rulers, all co-incident values have the same *difference*:

$2 - 0 = 2$
$3 - 1 = 2$
$7 - 5 = 2$
$4.7 - 2.7 = 2$

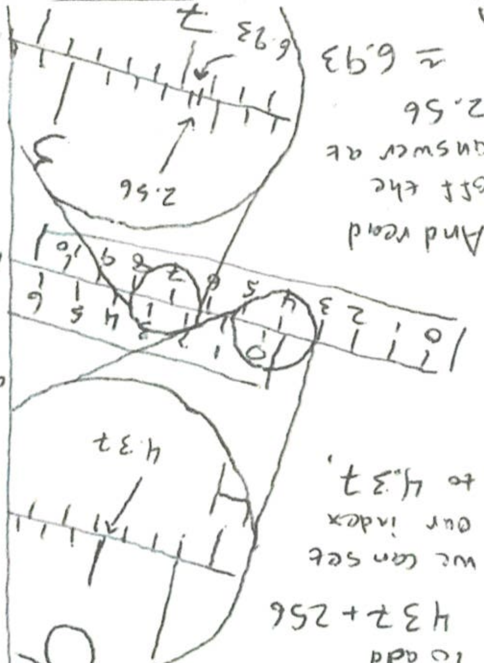


Here, our additive index (0) is set to 2.

With a tool like this, addition would be easy.

To add
$437 + 256$

we can set our index to 4.37,



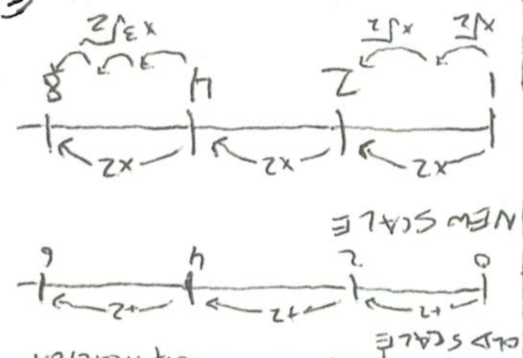
And read off the answer at 2.56

≈ 6.93

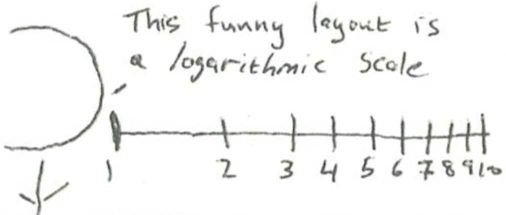
With physical scales, you can feel the limits to your precision, in a *visceral* way.

Addition is straight forward but how do we get those sliding rulers to multiply?

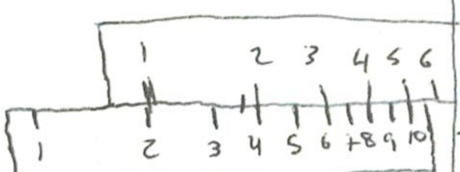
We need shifting to correspond to multiplication



This funny layout is a *logarithmic* scale

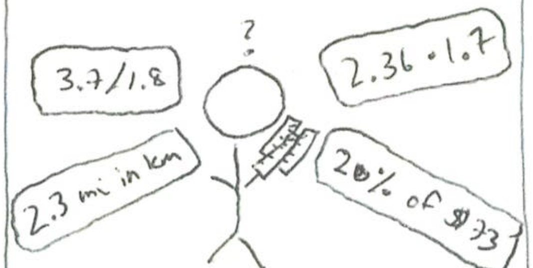


With two logarithmic scales, coincident points have the same *ratio*.



$2/1 = 2$
$4/2 = 2$
$6/3 = 2$
$3.6/1.8 = 2$

At its heart, this is all a *sliderule* is.

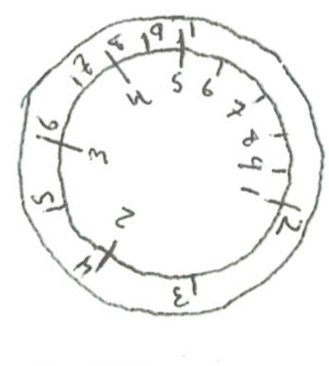


Think about how it can help with a wide array of problems.

Though, with a fixed rule you have to track powers of 10 yourself, and quickly run off the end of the rule

However ...

If you wrap the scales around, you get a *circular* slide rule.



To learn more and access a digital sliderule, visit https://blog.alexalemi.com/sliderules.html