

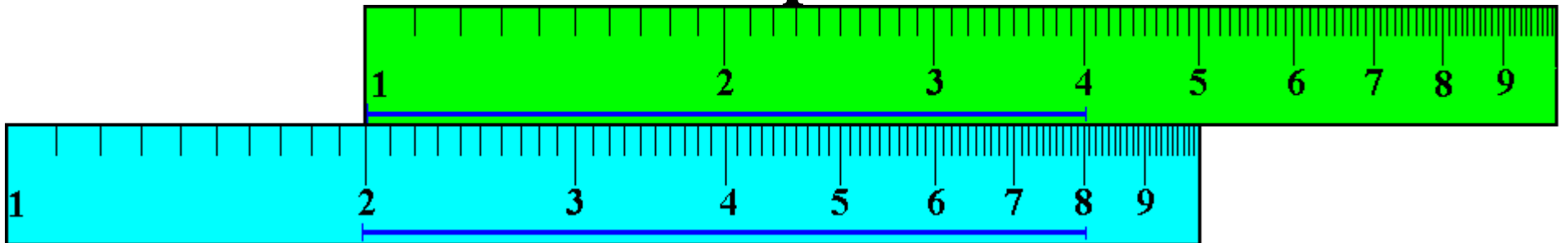
**THE SLIDE RULE:
THE POCKET CALCULATOR
OF THREE CENTURIES**

The C and D scales

These are logarithmic scales.

The logarithms of the numbers on the scale are evenly spaced.

Pairs of numbers which have the same ratio are the same distance apart.



$8:2 = 4:1$. You can check and see that 1.6 and 6.4 are also the same distance apart as 1 and 4.

What is a logarithm?

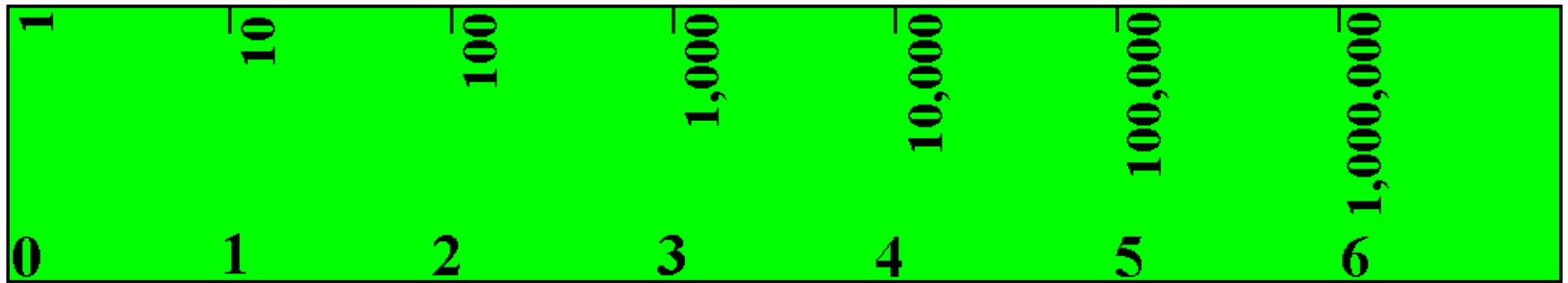
The common logarithm, or logarithm base 10, of a number is the power to which you need to raise 10 to produce that number.

10^3 (10 raised to the 3rd power) is 1,000.

The common logarithm of 1,000 is 3.

10^5 (10 raised to the 5th power) is 100,000.

The common logarithm of 100,000 is 5.



The power to which 10 is raised doesn't have to be a whole number.

$10^{0.301}$ is 2.

The common logarithm of 2 is 0.301.

Addition property of logarithms

$$\log xy = \log x + \log y$$

Why? It's connected with the addition property of exponents.

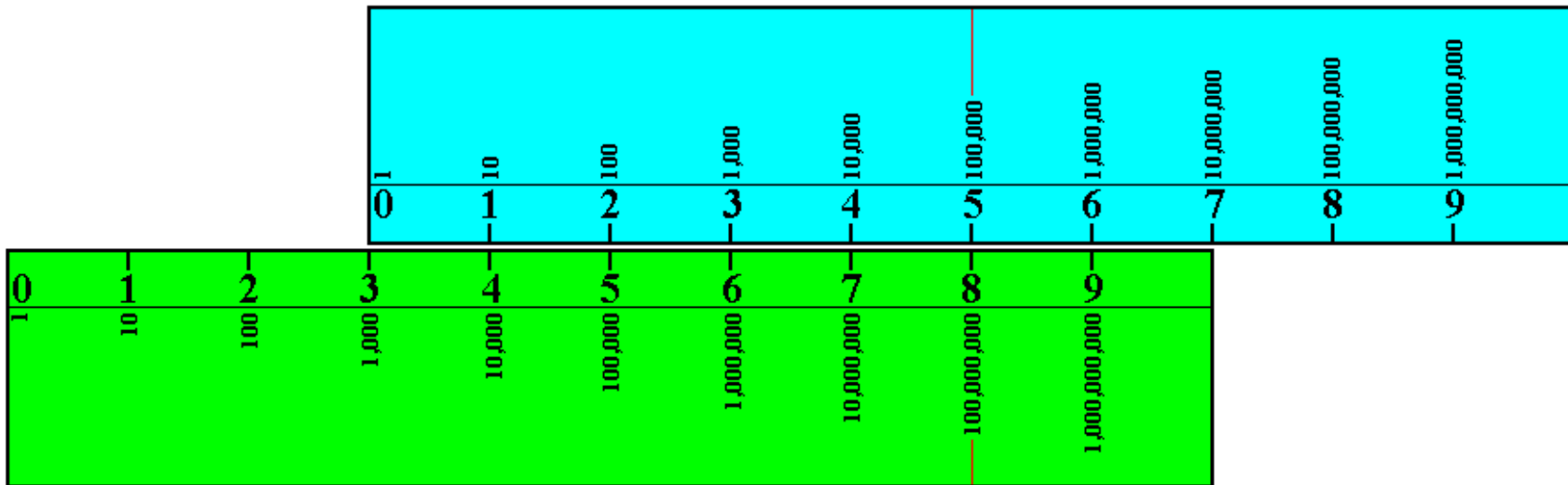
10^3 is $10 \times 10 \times 10$. 10^5 is $10 \times 10 \times 10 \times 10 \times 10$.

Multiply: $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10^8$.

$$1,000 \times 100,000 = 100,000,000$$

$$\log 1,000 + \log 100,000 = \log(100,000,000)$$

$$3 + 5 = 8$$



Slide rule multiplication is based on this addition property of logarithms.