

1
A **Addition / Subtraction**

- a **Addition** of whole numbers
- b **Addition** of numbers with decimal places
- c **Addition** of whole numbers when the number to be set exceeds the capacity of SR.
- d **Subtraction** with positive remainder with counting the number of terms subtracted
- e **Subtraction** with negative remainder - 1
- f **Subtraction** with negative remainder - 2

1
B **Multiplication**

- a Basic **multiplication**
- b **Multiplication** with constant factor
- c Shortened method of **multiplication - 1**
- d Shortened method of **multiplication - 1**
- e Shortened method of **multiplication - 1**
- f **Multiplication** with multiplicand already in CR

1
C **Division**

- a **Division** - additive method - 1
- b **Division** - additive method - 1a
- c **Division** - additive method - 2
- d **Division** - Subtractive method. (Useful when a result already exists in RR)
- e **Successive division.** (To get a result in RR)

1
D **Rule of three**

- a **Rule of three** - 1st method
- b **Rule of three** - 2nd method
- c **Rule of three** - 3rd method - Simultaneous calculation
- d **Rule of three** with complementary division - Type II
- e Extended **rule of three**

2

Roots

- a Square root - without initial approximation - Töpler's method 1 - Type II
- b Square root - without initial approximation - Töpler's method 2
- c Square root - without initial approximation - Töpler's method 3
- d Square root - without initial approximation - Friden style 1
- e Square root - without initial approximation - Friden style 2 - Type II
- f Square root - Hermann's method
- g Square root - Hermann's reverse method
- h Square root - Sabielny's method 1
- i Square root - Sabielny's method 2
- j Square root - classical method
- k Cube root
- l n root

3

Serial calculations

- a Continued multiplication 1 - with optical control
- b Continued multiplication 2
- c Powers calculation in series
- d Accumulation of quotients 1
- e Accumulation of quotients 2
- f Transfer multiplication
- g Evaluation of series

4

Geometry

- a Calculation of area from co-ordinates (shoelace method)
- b Sides of a triangle - Pythagoras theorem
- c Distance between two points - Pythagoras theorem
- d Calculation of co-ordinates
- e Determination of a side of an obtuse - angled triangle

5

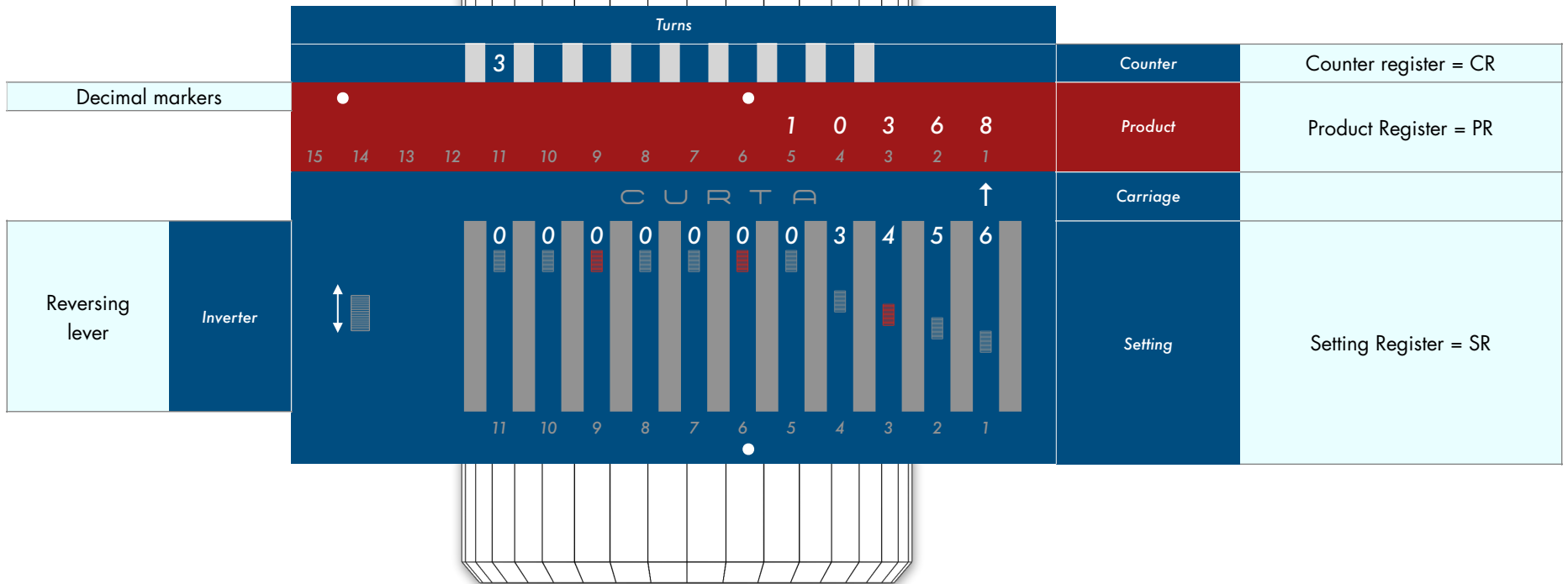
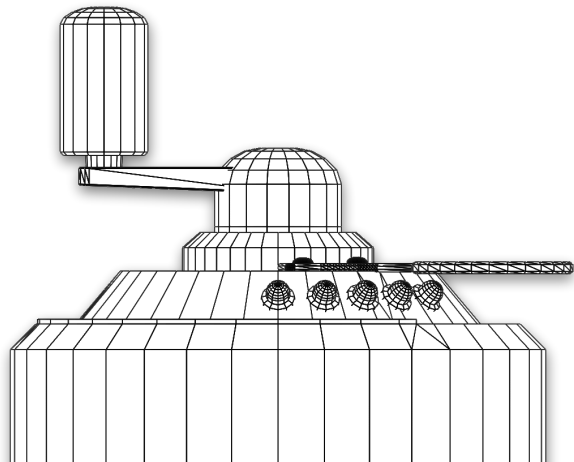
Statistics

- a Calculation of a sum and a sum of squares - Type II
- b Calculation with the '9' bridge - Type II
- c Serial Percentages with simultaneous control - Type II
- d Computation of arithmetic mean and standart deviation

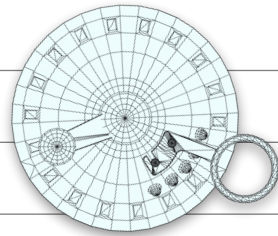
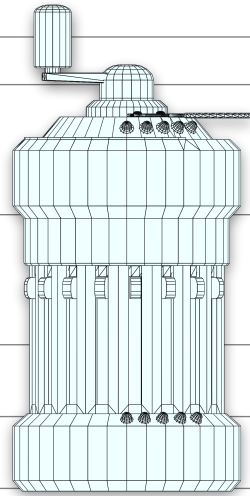
6

Number games

- a Collatz conjecture (Syracuse problem) ($3x+1$ algorithm)
- b The golden ratio with Fibonacci sequence
- c Multiplication by the Vedic method
- d Converting a decimal number to binary
- e Converting a binary number to decimal



Some hints... For the direct use of algorithms, it is assumed that the use of the Curta is known



Number and direction of handle turns

6 + / 1 -

Position of reversing lever

↑ / ↓

Clearing lever

Clear

Carriage position

8 7 > > 4 3 2
▲ ▲

Setting knobs

3 0 1 7

Intermediate calculation

1 7 4 4 0 3 6 8

Overflow / underflow result

9 9 9 9 9 2 1 5 5 5 3

Developing number (with carriage arrow)

3 4 6 9 4 3 4 3
▲

Note the highlighted number

2 7 2 4

Unchanged position/result/setting

- - - - - 3 4 6 9 4 3

Expected number (end of division/multiplication)

3 6 8.7 3
▲

Result (with decimal marker and carriage arrow)

2 5 9 8 9 5 6 8
▲

Thanks to Sean Johnston for the Curta font
and to Richard E. Deutsch / curta.li
for his support

The cards are designed to be perforated in the upper part (length) and placed in a binder

2k **Cube root - Type II**
 Let $\sqrt[3]{N}$ be determined. Let us assume that we already have an approximation A . Let $\sqrt[3]{N} = A + d$, hence $N = A^3 + 3A^2d + 3Ad^2 + d^3$
 By neglecting the terms in d^2 and d^3 , we obtain an approximation d_1 for d and consequently an approximation R for $\sqrt[3]{N}$
 $d_1 = (N - A^3) \div 3A^2$, $R = A + d_1 = A + (N - A^3) \div 3A^2$ (The error is practically $d_1^2 \div A$) This expression is easily calculated using the Curta

	Setting	Carriage/Inverter	Turns	Counter	Product
	$N = 560, A = 8.24, \sqrt[3]{560} = ?$				
	$\sqrt[3]{N} = A + (N - A^3) \div 3A^2$	Clear	↑	Clear	Clear
1	Set the initial approximation $A = 8.24$ Calculate A^2 : Develop A in CR	8 2 4	3 < 1	14 +	8,2 4
2	Set A^2	6 7 8 9 7 6	3	8 2 4	6 7 8 9 7 6
3				Clear	Clear
4	Calculate $3A^2$. Develop 3 in CR. In PR, we obtain $3A^2$ Note this number	6 7 8 9 7 6	3 +	3	2 0 3 6 9 2 8
5	Calculate A^3 Develop A in CR. A^3 in PR	6 7 8 9 7 6	7 > 4	7 +	8,2 4
6	Set $3A^2$ Calculate $A_1 = A + (N - A^3) \div 3A^2$ Division by additive method. (See 1Ca) Develop PR as close as possible to N	2 0 3 6 9 2 8	4	-	8 2 4
		2 0 3 6 9 2 8	3	2 +	8 2 4 2
		2 0 3 6 9 2 8	2	5 +	8 2 4 2 5
7	Result: 8.24257	2 0 3 6 9 2 8	1	7 +	8,2 4 2 5 7

Source: "Curta exemples de calcul", Contina / Bernard Stabile - 2023

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