

calc_decimal_example

Student Group

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$\$I.\quad\$$ Calculation example for decimal value

Idea: The number $\$2658.47\$$ is only the representation with the numerals $\$[0..9]\$,$ but what is the value behind it?

so lets start

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \color{black}{\{ } & \color{black}{\}} & \color{black}{\{2\}} & \color{black}{\{6\}} & \color{black}{\{5\}} & \color{black}{\{8.\}} & \color{black}{\{4\}} & \color{black}{\{7\}} \\ \color{white}{\text{index}:} & \color{white}{\{i\}} & \color{white}{\{3\}} & \color{white}{\{2\}} & \color{white}{\{1\}} & \color{white}{\{0\}} & \color{white}{\{-1\}} & \color{white}{\{-2\}} \\ \color{white}{\text{place value}:} & \color{white}{\{B^i\}} & \color{white}{\{10^3\}} & \color{white}{\{10^2\}} & \color{white}{\{10^1\}} & \color{white}{\{10^0\}} & \color{white}{\{10^{-1}\}} & \color{white}{\{10^{-2}\}} \\ \color{white}{\text{numerals}:} & \color{white}{\{z_i\}} & \color{white}{\{2\}} & \color{white}{\{6\}} & \color{white}{\{5\}} & \color{white}{\{8\}} & \color{white}{\{4\}} & \color{white}{\{7\}} \\ \color{white}{\text{calc}.:} & \color{white}{\{z_i \cdot B^i\}} & \color{white}{\{2000\}} & \color{white}{\{600\}} & \color{white}{\{50\}} & \color{white}{\{8\}} & \color{white}{\{0.4\}} & \color{white}{\{0.07\}} \\ \color{white}{\text{result}:} & \color{white}{\{\sum_i z_i \cdot B^i\}} & \color{white}{\{2658.47\}} \end{smallmatrix} \end{align*}
```

First: Put space between the numerals to see the thousands, hundreds, tens, ones, tenths, hundredths

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \color{black}{\{ } & \color{black}{\}} & \color{black}{\{2\}} & \color{black}{\{6\}} & \color{black}{\{5\}} & \color{black}{\{8.\}} & \color{black}{\{4\}} & \color{black}{\{7\}} \\ \color{blue}{\text{index}:} & \color{blue}{\{i\}} & \color{blue}{\{3\}} & \color{blue}{\{2\}} & \color{blue}{\{1\}} & \color{blue}{\{0\}} & \color{blue}{\{-1\}} & \color{blue}{\{-2\}} \\ \color{white}{\text{place value}:} & \color{white}{\{B^i\}} & \color{white}{\{10^3\}} & \color{white}{\{10^2\}} & \color{white}{\{10^1\}} & \color{white}{\{10^0\}} & \color{white}{\{10^{-1}\}} & \color{white}{\{10^{-2}\}} \\ \color{white}{\text{numerals}:} & \color{white}{\{z_i\}} & \color{white}{\{2\}} & \color{white}{\{6\}} & \color{white}{\{5\}} & \color{white}{\{8\}} & \color{white}{\{4\}} & \color{white}{\{7\}} \\ \color{white}{\text{calc}.:} & \color{white}{\{z_i \cdot B^i\}} & \color{white}{\{2000\}} & \color{white}{\{600\}} & \color{white}{\{50\}} & \color{white}{\{8\}} & \color{white}{\{0.4\}} & \color{white}{\{0.07\}} \\ \color{white}{\text{result}:} & \color{white}{\{\sum_i z_i \cdot B^i\}} & \color{white}{\{2658.47\}} \end{smallmatrix} \end{align*}
```

Second: Write down the index for each position.

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \color{black}{\{ } & \color{black}{\}} & \color{black}{\{2\}} & \color{black}{\{6\}} & \color{black}{\{5\}} & \color{black}{\{8.\}} & \color{black}{\{4\}} & \color{black}{\{7\}} \\ \color{black}{\text{index}:} & \color{black}{\{i\}} & \color{black}{\{3\}} & \color{black}{\{2\}} & \color{black}{\{1\}} & \color{black}{\{0\}} & \color{black}{\{-1\}} & \color{black}{\{-2\}} \\ \color{blue}{\text{place value}:} & \color{blue}{\{B^i\}} & \color{blue}{\{10^3\}} & \color{blue}{\{10^2\}} & \color{blue}{\{10^1\}} & \color{blue}{\{10^0\}} & \color{blue}{\{10^{-1}\}} & \color{blue}{\{10^{-2}\}} \\ \color{white}{\text{numerals}:} & \color{white}{\{z_i\}} & \color{white}{\{2\}} & \color{white}{\{6\}} & \color{white}{\{5\}} & \color{white}{\{8\}} & \color{white}{\{0.4\}} & \color{white}{\{0.01\}} \end{smallmatrix} \end{align*}
```


First: But space between the numerals to see the thousands, hundreds, tens, ones, tenths, hundredths

Table with columns for value, index, place value, digit, and calc. showing powers of 10 and their decimal equivalents.

Table with columns for aus (2+3), aus (6), aus (7) und (3), and (10), containing mathematical formulas and their results.

II. Betrachtung der Spannungsverstärkung

Table with columns for aus (0) and various mathematical formulas related to voltage gain and circuit analysis.

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