

calc_decimal_example

Student Group

First Name	Surname	Matrikel Nr.

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\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: But space between the numerals to
see the thousands, hundreds, tens, ones, tenths, hundredths
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\begin{align*} \begin{smallmatrix} \color{white}{\text{number}:} & \color{white}{} &
\color{white}{2} & \color{white}{6} & \color{white}{5} & \color{white}{8.} & \color{white}{4} &
\color{white}{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}{} & \color{white}{} & \color{white}{1000} &
\color{white}{100} & \color{white}{10} & \color{white}{1} & \color{white}{0.1} &
\color{white}{0.01} \\ \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: But space between the numerals to
see the thousands, hundreds, tens, ones, tenths, hundredths
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```
\begin{align*} \begin{smallmatrix} \color{blue}{\text{number}:} & \color{blue}{} & \color{blue}
{2} & \color{blue}{6} & \color{blue}{5} & \color{blue}{8.} & \color{blue}{4} & \color{blue}
{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{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{blue}{} & \color{blue}{} & \color{blue}{1000} & \color{blue}{100} & \color{blue}{10} &
\color{blue}{1} & \color{blue}{0.1} & \color{blue}{0.01} \\ \color{blue}{\text{numerals}:} &
\color{blue}{z_i} & \color{blue}{2} & \color{blue}{6} & \color{blue}{5} & \color{blue}{8} &
\color{blue}{4} & \color{blue}{7} \\ \color{blue}{\text{calc}.:} & \color{blue}{z_i \cdot B^i} &
\color{blue}{2000} & \color{blue}{600} & \color{blue}{50} & \color{blue}{8} & \color{blue}
{0.4} & \color{blue}{0.07} \\ \color{blue}{\text{result}:} & \color{blue}{\sum_i z_i \cdot B^i} &
& & & \color{blue}{2658.47} \\ \end{smallmatrix} \end{align*} First: But space between the
numerals to see the thousands, hundreds, tens, ones, tenths, hundredths
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```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \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{black}{\text{place value}:} & \color{black}{B^i} & \color{black}{10^3} &
\color{black}{10^2} & \color{black}{10^1} & \color{black}{10^0} & \color{black}{10^{-1}} &
\color{black}{10^{-2}} \\ \color{black}{} & \color{black}{} & \color{black}{1000} &
\color{black}{100} & \color{black}{10} & \color{black}{1} & \color{black}{0.1} &
\color{black}{0.01} \\ \color{black}{\text{numerals}:} & \color{black}{z_i} & \color{black}{2} &
\color{black}{6} & \color{black}{5} & \color{black}{8} & \color{black}{4} & \color{black}{7} \\
\color{black}{\text{calc}.:} & \color{black}{z_i \cdot B^i} & \color{black}{2000} &
\color{black}{600} & \color{black}{50} & \color{black}{8} & \color{black}{0.4} &
\color{black}{0.07} \\ \color{black}{\text{result}:} & \color{black}{\sum_i z_i \cdot B^i} & & &
\color{black}{2658.47} \\ \end{smallmatrix} \end{align*} First: But space between the numerals to
see the thousands, hundreds, tens, ones, tenths, hundredths
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$\sum_{i=0}^7 z_i \cdot B^i$ & $\{2000\}$ & $\{600\}$ & $\{50\}$ & $\{8\}$ & $\{0.4\}$ & $\{0.07\}$ \\
 \text{result}:} & $\sum_{i=0}^7 z_i \cdot B^i$ & & $\{2658.47\}$ \\
 \end{smallmatrix} \end{align*}

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

value		2	6	5	8 ,	4	7	
index	\$i\$	3	2	1	0	-1	-2	
$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$	$\$ \backslash \text{quad} \backslash \text{quad} \$$
place value	$\$ B^i \$$	$\$ \text{small}\{10^3\} \$$	$\$ \text{small}\{10^2\} \$$	$\$ \text{small}\{10^1\} \$$	$\$ \text{small}\{10^0\} \$$	$\$ \text{small}\{10^{-1}\} \$$	$\$ \text{small}\{10^{-2}\} \$$	
digit	$\$ z_i \$$	2	6	5	8	4	7	
calc.	$\$ z_i \backslash \text{cdot} B^i \$$	2000	600	50	8	0.4	0.07	
Result	$\$ \sum_{i=0}^7 z_i \backslash \text{cdot} B^i \$$	2658,47						
aus (2+3)		$\$ \text{color}\{blue\}\{I_p\} = \text{color}\{blue\}\{I_m\} = 0 \$$			$\$ I_p \$$ und $\$ I_m \$$ sind damit definiert			
aus (6)		$\$ \text{color}\{blue\}\{I_o\} = I_1 \$$			$\$ I_o \$$ ist damit bekannt, wenn $\$ I_1 \$$ bekannt ist			
aus (7) und (3)		$\$ I_1 - I_2 - \text{color}\{blue\}\{0\} = 0 \$$			$\$ \backslash \text{quad} \$$			
		$\$ I_1 = I_2 = I_o \$$			$\$ \backslash \text{quad} \$$			
		$\$ \text{color}\{blue\}\{I_1\} = \text{color}\{blue\}\{I_2\} = \text{color}\{blue\}\{I_o\} \$$			mit (8) und (9): $\$ I_{\text{boxed}\{ }\} = \text{frac}\{U_{\text{boxed}\{ }\}\}\{R_{\text{boxed}\{ }\}\} \$$ und (5)			
		$\$ \text{frac}\{U_1\}\{R_1\} = \text{frac}\{U_2\}\{R_2\} = \text{frac}\{U_A\}\{R_1 + R_2\} \$$			Spannungsteilerformel, $\$ I = \text{const.} \$$			
(10)		$\$ U_2 = U_A \cdot \text{frac}\{R_2\}\{R_1 + R_2\} \$$			Spannungsteilerformel			

II. Betrachtung der Spannungsverstärkung

aus (0)	$\$ \text{color}\{blue\}\{A_V\} = \text{frac}\{U_A\}\{U_E\} \$$	$\$ \backslash \text{quad} \$$
	$\$ A_V = \text{frac}\{U_A\}\{\text{color}\{blue\}\{U_E\}\} \$$	mit (4): $\$ U_E = U_2 + U_D \$$
	$\$ A_V = \text{frac}\{U_A\}\{\text{color}\{blue\}\{U_2 + U_D\}\} \$$	$\$ \backslash \text{quad} \$$
	$\$ A_V = \text{frac}\{U_A\}\{\text{color}\{blue\}\{U_2\} + U_D\} \$$	mit (10): $\$ U_2 = U_A \cdot \text{frac}\{R_2\}\{R_1 + R_2\} \$$
	$\$ A_V = \text{frac}\{U_A\}\{\text{color}\{blue\}\{U_A \cdot \text{frac}\{R_2\}\{R_1 + R_2\} + U_D\}\} \$$	$\$ \backslash \text{quad} \$$
	$\$ A_V = \text{frac}\{U_A\}\{U_A \cdot \text{frac}\{R_2\}\{R_1 + R_2\} + U_D\} \$$	mit (1)
	$\$ A_V = \text{frac}\{U_A\}\{U_A \cdot \text{frac}\{R_2\}\{R_1 + R_2\} + \text{color}\{blue\}\{U_D\}\} \$$	$\$ \text{frac}\{1\}\{\text{frac}\{R_2\}\{R_1 + R_2\} + \text{color}\{blue\}\{A_D\}\} \$$
	$\$ A_V = \text{frac}\{1\}\{\text{frac}\{R_2\}\{R_1 + R_2\} + \text{color}\{blue\}\{A_D\}\} \$$	$\$ \backslash \text{quad} \$$
	$\$ A_V = \text{frac}\{1\}\{\text{frac}\{R_2\}\{R_1 + R_2\} + \text{color}\{blue\}\{A_D\}\} \$$	Bruch umformen
	$\$ A_V = \text{frac}\{R_1 + R_2\}\{R_1 + R_2 + \text{color}\{blue\}\{A_D\} \cdot R_2\} \$$	$\$ \backslash \text{quad} \$$

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