

calc_decimal_example

Student Group

First Name	Surname	Matrikel Nr.

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$\text{\color{black}\{2658.47\}}$ 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	$\$ \sum_i z_i \backslash \text{cdot} B^i$	2658,47						

aus (2+3)	$\$ \text{color}\{blue\}\{I_p\} = \text{color}\{blue\}\{I_m\} = 0 \$$	$\$ I_p \$ \text{ und } \$ I_m \$ \text{ sind damit definiert}$
aus (6)	$\$ \text{color}\{blue\}\{I_o\} = I_1 \$$	$\$ I_o \$ \text{ ist damit bekannt, wenn } \$ I_1 \$ \text{ bekannt ist}$
aus (7) und (3)	$\$ I_1 - I_2 - \text{color}\{blue\}\{0\} = 0 \$$	$\$ \text{quad} \$$
	$\$ I_1 = I_2 = I_o \$$	$\$ \text{quad} \$$
	$\$ \text{color}\{blue\}\{I_1\} = \text{color}\{blue\}\{I_2\} = \text{color}\{blue\}\{I_o\} \$$	mit (8) und (9): $\$ I_{\text{boxed}\{1\}} = \text{frac}\{U_{\text{boxed}\{1}}\}\{R_{\text{boxed}\{1}}\} \$$ 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)	$\$ U_2 = U_A \text{cdot} \text{frac}\{R_2\}\{R_1 + R_2\} \$$	Spannungsteilerformel

II. Betrachtung der Spannungsverstärkung

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

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