

# calc\_decimal\_example

## Student Group

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|------------|---------|--------------|
|            |         |              |
|            |         |              |
|            |         |              |

## Table of Contents

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$\$1.\!\!\!\!\!\quad$  Calculation example for decimal value

|       |   |   |   |   |    |    |
|-------|---|---|---|---|----|----|
| value | 2 | 6 | 5 | 8 | 4  | 7  |
| index | 3 | 2 | 1 | 0 | -1 | -2 |
|       |   |   |   |   |    |    |
|       |   |   |   |   |    |    |

|             |                 |            |            |            |            |               |               |
|-------------|-----------------|------------|------------|------------|------------|---------------|---------------|
| value       |                 | 2          | 6          | 5          | 8 ,        | 4             | 7             |
| index       | \$i\$           | 3          | 2          | 1          | 0          | -1            | -2            |
| place value | $B^i$           | $\{10^3\}$ | $\{10^2\}$ | $\{10^1\}$ | $\{10^0\}$ | $\{10^{-1}\}$ | $\{10^{-2}\}$ |
|             |                 | $\{1000\}$ | $\{100\}$  | $\{10\}$   | $\{1\}$    | $\{0.10\}$    | $\{0.01\}$    |
| digit       | $z_i$           | 2          | 6          | 5          | 8          | 4             | 7             |
| calc.       | $z_i \cdot B^i$ | 2000       | 600        | 50         | 8          | 0.4           | 0.07          |

|                        |         |
|------------------------|---------|
| Result                 |         |
| $\sum_i z_i \cdot B^i$ | 2658,47 |
|                        |         |

|                 |                                                                                                                                                                                  |                                                                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| aus (2+3)       | $\textcolor{blue}{l_1 p} = \textcolor{blue}{l_1 m} = 0 \$$                                                                                                                       | $\$l_1 p \$$ und $\$l_1 m \$$ sind damit definiert                                                                                       |
|                 |                                                                                                                                                                                  |                                                                                                                                          |
| aus (6)         | $\textcolor{blue}{l_1 o} = l_1 \$$                                                                                                                                               | $\$l_1 o \$$ ist damit bekannt, wenn $\$l_1 \$$ bekannt ist                                                                              |
|                 |                                                                                                                                                                                  |                                                                                                                                          |
| aus (7) und (3) | $\$l_1 - l_2 - \textcolor{blue}{0} = 0 \$$                                                                                                                                       | $\$l_{\text{quad}} \$$                                                                                                                   |
|                 |                                                                                                                                                                                  |                                                                                                                                          |
|                 | $\$l_1 = l_2 = l_{o \$}$                                                                                                                                                         | $\$l_{\text{quad}} \$$                                                                                                                   |
|                 |                                                                                                                                                                                  |                                                                                                                                          |
|                 | $\textcolor{blue}{l_1 1} = \textcolor{blue}{l_1 2} = \textcolor{blue}{l_1 o} \$$                                                                                                 | mit (8) und (9): $\$l_{\text{boxed}} \{ \} = \frac{\textcolor{blue}{l_1 1}}{\textcolor{blue}{l_1 2}} \textcolor{blue}{l_1 o} \$$ und (5) |
|                 |                                                                                                                                                                                  |                                                                                                                                          |
|                 | $\frac{\textcolor{blue}{l_1 1}}{\textcolor{blue}{l_1 2}} = \frac{\textcolor{blue}{l_1 1}}{\textcolor{blue}{l_1 2}} = \frac{\textcolor{blue}{l_1 1}}{\textcolor{blue}{l_1 2}} \$$ | Spannungsteilerformel, $\$l_1 = \text{const.} \$$                                                                                        |
|                 |                                                                                                                                                                                  |                                                                                                                                          |
| (10)            | $\$U_2 = U_{\text{Alc}} \cdot \frac{\textcolor{blue}{l_1 2}}{\textcolor{blue}{l_1 1} + \textcolor{blue}{l_1 2}} \$$                                                              | Spannungsteilerformel                                                                                                                    |
|                 |                                                                                                                                                                                  |                                                                                                                                          |

## \$II.\quad\$ Betrachtung der Spannungsverstärkung

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

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