

## Radice quadrata a mano Square root by hand

$$\sqrt{288,00} = 16,9$$

/-----	
\ / 2.88,00	<u>16,9</u>
1	29x9=261
188	28x8=224
156	27x7=189
3200	26x6=156
2961	329x9=2961 (*)
239	

288	2
144	2
72	2
36	! 2
18	! 2
9	! 3x3
1	

(\*) massimo 9 volte

VERIFICO  
 $288 = 16,9^2 + 2,39 = 285,61 + 2,39 = 288$

$$\begin{aligned}\sqrt{288} &= \sqrt{2^5 \cdot 3^2} = \\ &= \sqrt{2^2} \sqrt{2^2} \sqrt{3^2} \sqrt{2} = 12\sqrt{2}\end{aligned}$$

$$\sqrt{61504,00} = 248$$

/-----	
\ / 6.15.04	<u>248</u>
4	45x5=225 (*)
215	24x4=176
176	-----
3904	488x8=3904
3904	329x9=2961 (*)
0	

61504	2
30752	2
15376	! 2
7688	! 2
3844	! 2
1922	2
961	31
31	31
1	

(\*) massimo 9 volte

VERIFICO  
 $61504 = 248^2$

$$\begin{aligned}\sqrt{61504} &= \sqrt{2^6 \cdot 31^2} = \\ &= \sqrt{2^2} \sqrt{2^2} \sqrt{2^2} \sqrt{31^2} = \\ &= 2 \cdot 2 \cdot 2 \cdot 31 = 8 \cdot 31 = 248\end{aligned}$$

$$\sqrt{1296} = 36$$

/-----	
\ / 12.96	<u>348</u>
9	66x6=396
396	-----
396	
0	

1296	2
.648	2
324	2
.162	2
.081	3x3
.009	3x3
.001	

$$\begin{aligned}\sqrt{1296} &= \sqrt{2^4 \cdot 3^4} = \\ &= \sqrt{2^4} \cdot \sqrt{3^4} = 2^2 \cdot 3^2 = 6^2 = 36\end{aligned}$$

$$\sqrt{11025}$$

```

/-----
\1.10.25 | 108
  1       | 20x0=0
  =10     | -----
  0       | 205x5=1025
  1025    |
  1025    |
  0       |
    
```

```

11025 | 5
.2205 | 5
..441  | 3
..147  | 3
...49  | 7x7
.....1 |
    
```

$$\sqrt{11025} = \sqrt{3^2 \cdot 5^2 \cdot 7^2} =$$

$$= \sqrt{3^2} \cdot \sqrt{5^2} \cdot \sqrt{7^2} = 3 \cdot 5 \cdot 7 = 105$$

$$\sqrt{169} = 13$$

```

/-----
\1.69 | 13
  1   | 23x3=69
  =69 |
  69  |
  0   |
    
```

```

169 | 13
.13 | 13
..1  |
    
```

$$\sqrt{169} = \sqrt{13^2} = 13$$

$$\sqrt{645} = 25,3969\dots$$

```

/-----
\6.45 | 25,39
  4   | 46x6=276
  245 | 45x5=225
  225 | 504x4=2016
  2000 | 503x3=1509
  1591 | 5069x9=45621
  49100 |
  45621 |
  3479  |
    
```

```

645 | 5
129 | 3
 43 | 43
  1 |
    
```

$$\sqrt{645} \dots$$

$$645 = 25.39^2 + 0.3479 = 644.6521 + 0.3479$$

$$\sqrt{1575}^{0,1} = 39,68626$$

```

/-----
\15.75,00 | 39,6
  9       | 69x9=621
  675    | 786x6=4716
  621    |
  5400   |
  4716   |
  684    |
    
```

```

1575 | 3
 525 | 3
 175 | 5
  35 | 5
   7 | 7
   1 |
    
```

$$\sqrt{1575} = \sqrt{3^2 \cdot 5^2 \cdot 7} = 15\sqrt{7}$$

$$39,6^2 + 6.84 = 1575$$

$$\sqrt{9216} = 96$$

```

/-----
\ /92.16 | 96
  81     | 186x6=1116
  1116   | -----
  1116   |
   0     |
  
```

```

9216 | 2
4608 | 2
2304 | 2
1152 | 2
 576 | 2
 288 | 2
 144 | 2
  72 | 2
  36 | 2^2x3^2
   1 |
  
```

$$\sqrt{9216} = \sqrt{2^{10} \cdot 3^2} = \sqrt{2^{10}} \cdot \sqrt{3^2} = 2^5 \cdot 3 = 96$$



$$\sqrt{198025} = 445$$

```

/-----
\ /19.80.25 | 445
  16         | 84x4=336
  380       | 885x5=4425
  336       |
  4425     |
  4425     |
   0       |
  
```

```

198025 | 5
39605  | 5
 7921   | 89
  89    | 89
   1    |
  
```

$$\sqrt{198025} = \sqrt{5^2 \cdot 89^2} = \sqrt{5^2} \cdot \sqrt{89^2} = 5 \cdot 89 = 445$$



$$\sqrt{922} = 30,36445\dots$$

$$\sqrt{173} = 13,1529\dots$$

```

9.22 | 30,364
  9   | 60x0=0
02.2 | 603x3=1809
  0   | 6066x6=36396
220.0 | 60724x4=242896
180.9 |
 3910.0 |
 3639.6 |
 27040.0 |
 24289.6 |
  27504 |
  
```

$$922 = 30.364^2 + .027504$$

```

1.73 | 13,152
  1   | 23x3=69
07.3 | 261x1=261
  6.9 | 2625x5=13125
 40.0 | 26302x2=52604
 26.1 |
1390.0 |
1312.5 |
  7750.0 |
  5260.4 |
  24869 |
  
```

$$173 = 13.152^2 + .024869$$



$$\sqrt{384}^{0,1} = 19,5$$

$\begin{array}{r} \sqrt{3.84,00} \\ \underline{1} \\ 284 \\ \underline{261} \\ 2300 \\ \underline{1925} \\ 375 \end{array}$	$\begin{array}{r} \underline{\underline{19,5}} \\ 29 \times 9 = 261 \\ \underline{\underline{386 \times 6 = 2316}} \\ 385 \times 5 = 1925 \end{array}$
---	--

$$19,5^2 + 3.75 = 384$$

$$\sqrt{7,5}^{0,01} = 2,73$$

$\begin{array}{r} \sqrt{7,50.00} \\ \underline{4} \\ 350 \\ \underline{329} \\ 2100 \\ \underline{1629} \\ 471 \end{array}$	$\begin{array}{r} \underline{\underline{2,73}} \\ 48 \times 8 = 384 \\ \underline{\underline{47 \times 7 = 329}} \\ 543 \times 3 = 1629 \end{array}$
---	--

$$2,73^2 + 0.0471 = 7,5$$

$$\sqrt{1,84}^{0,1} = 1,3$$

$\begin{array}{r} \sqrt{1,84} \\ \underline{1} \\ =84 \\ \underline{69} \\ 15 \end{array}$	$\begin{array}{r} \underline{\underline{1,3}} \\ 24 \times 4 = 96 \\ \underline{\underline{23 \times 3 = 69}} \end{array}$
--	--

$$1,3^2 + 0,15 = 1,84$$

$$\sqrt{1,84}^{0,01} = 1,35$$

$\begin{array}{r} \sqrt{1,84.00} \\ \underline{1} \\ =84 \\ \underline{69} \\ 1500 \\ \underline{1325} \\ 175 \end{array}$	$\begin{array}{r} \underline{\underline{1,35}} \\ 24 \times 4 = 96 \\ \underline{\underline{23 \times 3 = 69}} \\ 265 \times 5 = 1325 \end{array}$
--	--

$$1,35^2 + 0,0175 = 1,8225 + 0.0175$$

$$\sqrt{5299,84} = 72,8$$

$\begin{array}{r} 52.99,84 \\ \underline{49} \\ 39.9 \\ \underline{28.4} \\ 1158.4 \\ \underline{1158.4} \\ 0 \end{array}$	$\begin{array}{r} \underline{\underline{72,8}} \\ 142 \times 2 = 284 \\ \underline{\underline{1448 \times 8 = 11584}} \end{array}$
--	--

$$\sqrt{734,41} = 27,1$$

$\begin{array}{r} 7.34,41 \\ \underline{4} \\ 33.4 \\ \underline{32.9} \\ 54.1 \\ \underline{54.1} \\ 0 \end{array}$	$\begin{array}{r} \underline{\underline{27,1}} \\ 49 \times 9 = 441 \\ \underline{\underline{48 \times 8 = 384}} \\ 47 \times 7 = 329 \\ \underline{\underline{541 \times 1 = 541}} \end{array}$
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$$\sqrt{8,067}^{0,001} = 2,84024...$$

$\begin{array}{r} 8,06.70.00 \\ \underline{4} \\ 40.6 \\ \underline{38.4} \\ 227.0 \\ \underline{225.6} \\ 140.0 \\ \underline{140.0} \\ 0 \end{array}$	$\begin{array}{r} \underline{\underline{2,840}} \\ 49 \times 9 = 441 \\ \underline{\underline{48 \times 8 = 384}} \\ 564 \times 4 = 2256 \\ \underline{\underline{5680 \times 0 = 0}} \end{array}$
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$$8,067 = 2.84^2 + .001400$$

$$\sqrt{4,532}^{0,001} = 2,12884...$$

$\begin{array}{r} 4,53.20.00 \\ \underline{4} \\ 05.3 \\ \underline{4.1} \\ 122.0 \\ \underline{84.4} \\ 3760.0 \\ \underline{3382.4} \\ 3776 \end{array}$	$\begin{array}{r} \underline{\underline{2,128}} \\ 41 \times 1 = 41 \\ \underline{\underline{422 \times 2 = 844}} \\ 4229 \times 9 = 38061 \\ \underline{\underline{4228 \times 8 = 33842}} \end{array}$
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$$4.532 = 2.128^2 + .003776$$

$$\sqrt{14,4(6)}^{0,001} = 3,803$$

$\begin{array}{r} /----- \\ \sqrt{14,46.66.66} \\ 9 \\ \underline{546} \\ 544 \\ \underline{266} \\ 0 \\ \underline{26666} \\ 22809 \\ \underline{3857} \end{array}$	$\begin{array}{l} \underline{\underline{3,803}} \\ 69 \times 9 = 621 \\ 68 \times 8 = 544 \\ 760 \times 0 = 0 \\ 7603 \times 3 = 22809 \\ ----- \end{array}$
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$$3,803^2 + 0.003857 = 14,4(6)$$

$$\sqrt{6,5}^{0,001} = 2,549$$

$\begin{array}{r} /----- \\ \sqrt{6,50.00.00} \\ 4 \\ \underline{250} \\ 225 \\ \underline{2500} \\ 2016 \\ \underline{48400} \\ 45801 \\ \underline{2599} \end{array}$	$\begin{array}{l} \underline{\underline{2,549}} \\ 45 \times 5 = 225 \\ 505 \times 5 = 2525 \\ 504 \times 4 = 2016 \\ 5089 \times 9 = 45801 \\ ----- \end{array}$
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$$2,549^2 + 0.002599 = 6,5$$

$$\sqrt{53,21}^{0,01} = 7,29$$

$\begin{array}{r} /----- \\ \sqrt{53,21.00} \\ 49 \\ \underline{421} \\ 284 \\ \underline{13700} \\ 13041 \\ \underline{659} \end{array}$	$\begin{array}{l} \underline{\underline{7,29}} \\ 143 \times 3 = 429 \\ 142 \times 2 = 284 \\ 1449 \times 9 = 13041 \\ 7603 \times 3 = 22809 \\ ----- \end{array}$
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$$7,29^2 + 0.0659 = 53,21$$

$$\sqrt{5,972}^{0,01} = 2,44$$

$\begin{array}{r} /----- \\ \sqrt{5,97.20} \\ 4 \\ \underline{197} \\ 176 \\ \underline{2120} \\ 1936 \\ \underline{184} \end{array}$	$\begin{array}{l} \underline{\underline{2,44}} \\ 44 \times 4 = 176 \\ 484 \times 4 = 1936 \\ ----- \end{array}$
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$$2,44^2 + 0.0184 = 5,972$$

$$\sqrt{0,5714}^{0,001} = 0,755$$

$\begin{array}{r} /----- \\ \sqrt{0,57.14.00} \\ 49 \\ \underline{814} \\ 725 \\ \underline{8900} \\ 7525 \\ \underline{1375} \end{array}$	$\begin{array}{l} \underline{\underline{0,755}} \\ 145 \times 5 = 725 \\ 1505 \times 5 = 7525 \\ ----- \end{array}$
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$$0,755^2 + 0.001375 = 0,5714$$

$$\sqrt{0,2858}^{0,01} = 0,53$$

$\begin{array}{r} /----- \\ \sqrt{0,28.58} \\ 25 \\ \underline{358} \\ 309 \\ \underline{49} \end{array}$	$\begin{array}{l} \underline{\underline{0,53}} \\ 103 \times 3 = 309 \\ ----- \end{array}$
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$$0,53^2 + 0.0049 = 0,2858$$

$$\sqrt{215729}^{0,01} = 464,46$$

$\begin{array}{r} /----- \\ \sqrt{21.57.29,00.00} \\ 16 \\ \underline{557} \\ 516 \\ \underline{4129} \\ 3696 \end{array}$	$\begin{array}{l} \underline{\underline{464,46}} \\ 86 \times 6 = 516 \\ 924 \times 4 = 3696 \\ 9284 \times 4 = 37136 \\ 92886 \times 6 = 557316 \\ ----- \end{array}$
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$$\begin{array}{r}
 43300 \\
 37136 \\
 \hline
 616400 \\
 557316 \\
 \hline
 59084
 \end{array}$$

$$464,46^2 + 5,9084 = 215729$$

$$\sqrt{307215}^{0,01} = 554,26$$

$  \begin{array}{r}  /----- \\  \sqrt{30.72.15,00.00} \\  25 \\  \hline  572 \\  525 \\  \hline  4715 \\  4416 \\  \hline  19900 \\  22164 \\  \hline  773600 \\  665076 \\  \hline  108524  \end{array}  $	$  \begin{array}{r}  \underline{\underline{554,26}} \\  \underline{105 \times 5 = 525} \\  \underline{1104 \times 4 = 4416} \\  \underline{11082 \times 2 = 22164} \\  \underline{110846 \times 6 = 665076}  \end{array}  $
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$$554,26^2 + 10,8524 = 217215$$

$$\sqrt{359777}^{0,01} = 599,81$$

$  \begin{array}{r}  /----- \\  \sqrt{35.97.77,00.00} \\  25 \\  \hline  1097 \\  981 \\  \hline  11677 \\  10701 \\  \hline  97600 \\  95904 \\  \hline  169600 \\  119961 \\  \hline  49639  \end{array}  $	$  \begin{array}{r}  \underline{\underline{599,81}} \\  \underline{109 \times 9 = 981} \\  \underline{1189 \times 9 = 10701} \\  \underline{11988 \times 8 = 95904} \\  \underline{119961 \times 1 = 119961}  \end{array}  $
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$$599,81^2 + 4,9639 = 359777$$

## Keywords

Estrazione di radice quadrata - Square root by hand  
 radicali, estrazione di radice, radice quadrata, quadrati perfetti, radice quadrata a mano, square root,  
 square root by hand, I, radq(), sqr(), squareroot, pencil paper, manual calculate  
 Quadratwurzel Wurzel ziehen Stift Bleistift Papier Napier Neper Rechenstäbchen Rechenstab  
 Multiplikation Division Erklärung Rechenschieber