

## Radice quadrata a mano

*Square root by hand*

- 
1.  $\sqrt{24}^{0,01}$  [\[soluzione\]](#)
  - $\sqrt{256}$  [\[soluzione\]](#)
  2.  $\sqrt{72}^{0,01}$  [\[soluzione\]](#)
  - $\sqrt{61\,504}$  [\[soluzione\]](#)
  3.  $\sqrt{169}$  [\[soluzione\]](#)
  4.  $\sqrt{173}^{0,01}$  [\[soluzione\]](#)
  5.  $\sqrt{288}^{0,1}$  [\[soluzione\]](#)
  6.  $\sqrt{384}^{0,1}$  [\[soluzione\]](#)
  7.  $\sqrt{645}^{0,01}$  [\[soluzione\]](#)
  8.  $\sqrt{648}^{0,01}$  [\[soluzione\]](#)
  9.  $\sqrt{922}^{0,01}$  [\[soluzione\]](#)
  10.  $\sqrt{1296}$  [\[soluzione\]](#)
  11.  $\sqrt{1575}^{0,01}$  [\[soluzione\]](#)
  12.  $\sqrt{3750}^{0,01}$  [\[soluzione\]](#)
  13.  $\sqrt{9216}$  [\[soluzione\]](#)
  14.  $\sqrt{11025}$  [\[soluzione\]](#)
  15.  $\sqrt{61505}$  [\[soluzione\]](#)
  16.  $\sqrt{215729}^{0,01}$  [\[soluzione\]](#)
  17.  $\sqrt{307215}^{0,01}$  [\[soluzione\]](#)
  18.  $\sqrt{359777}^{0,01}$  [\[soluzione\]](#)
  19.  $\sqrt{198025}$  [\[soluzione\]](#)
  20.  $\sqrt{1,84}^{0,01}$  [\[soluzione\]](#)
  21.  $\sqrt{5299,84}^{0,1}$  [\[soluzione\]](#)
  - $\sqrt{734,41}^{0,01}$  [\[soluzione\]](#)
  22.  $\sqrt{8,067}^{0,01}$  [\[soluzione\]](#)
  - $\sqrt{4,532}^{0,01}$  [\[soluzione\]](#)
  23.  $\sqrt{14,46}^{0,01}$  [\[soluzione\]](#)

24.  $\sqrt{6,5}^{0,01}$  [\[soluzione\]](#)
- $\sqrt{53,21}^{0,01}$  [\[soluzione\]](#)
- $\sqrt{5,972}^{0,01}$  [\[soluzione\]](#)
25.  $\sqrt{0,5714}^{0,01}$  [\[soluzione\]](#)
- $\sqrt{0,2858}^{0,01}$  [\[soluzione\]](#)
26.  $\sqrt{7,5}^{0,01}$  [\[soluzione\]](#)
- $\sqrt{7,75}^{0,01}$  [\[soluzione\]](#)
27.  $\sqrt{2,45}^{0,01}$  [\[soluzione\]](#)
- $\sqrt{4,5}^{0,01}$  [\[soluzione\]](#)
28.  $\sqrt{1,2045}^{0,01}$  [\[soluzione\]](#)
- $\sqrt{1,2916}^{0,01}$  [\[soluzione\]](#)
29.  $\sqrt{5,25}^{0,01}$  [\[soluzione\]](#)

## SOLUZIONI

$$\begin{array}{r|l} /----- \\ \sqrt{24,00.00} & \mathbf{4,89} \\ \hline 16 & | 89 \times 9 = 801 \\ \hline =80\mathbf{0} & | 88 \times 8 = 704 \\ 704 & | 969 \times 9 = 8721 \\ \hline 960\mathbf{0} & | \\ 8721 & | \\ \hline 879 & | \end{array}$$

$$\begin{array}{r|l} 24 & | 2 \\ 12 & | 2 \\ .6 & | 2 \times 3 \\ 1 & | \end{array}$$

$$\sqrt{24} = \sqrt{2^2 \cdot 2 \cdot 3} = \sqrt{2^2} \cdot \sqrt{6} = 2\sqrt{6}$$

$$4,89^2 + 0,0789 = 24$$

$$\begin{array}{r|l} /----- \\ \sqrt{2.56} & \mathbf{16} \\ \hline 1 & | 27 \times 7 = 189 \\ \hline 15\mathbf{6} & | 26 \times 6 = 156 \\ 166 & | \\ \hline 0 & | \end{array}$$

$$\begin{array}{r|l} 256 & | 2 \\ 128 & | 2 \\ 64 & | 2 \\ 32 & | 2 \\ 16 & | 2 \\ 8 & | 2 \\ 4 & | 2 \\ 2 & | 2 \\ 1 & | \end{array}$$

$$16^2 = 256$$

$$\sqrt{256} = \sqrt{2^8} = 2^4 = 16$$

$$\begin{array}{r|l} /----- \\ \sqrt{72,00.00} & \mathbf{8,48} \\ \hline 64 & | 164 \times 4 = 656 \\ \hline =800 & | 1688 \times 8 = 13504 \\ 656 & | \\ \hline 14400 & | \\ 13506 & | \\ \hline 896 & | \end{array}$$

$$\begin{array}{l} 72 \ | 2 \\ 36 \ | 2 \\ 18 \ | 2 \\ .9 \ | 3 \times 3 \\ 1 \ | \end{array}$$

$$\sqrt{72} = \sqrt{2^2 \cdot 2 \cdot 3^2} = 6\sqrt{2}$$

$$8,48^2 + 0,0896 = 72$$

$$\begin{array}{r|l} /----- \\ \sqrt{6.15.04} & \mathbf{248} \\ \hline 4 & | 45 \times 5 = 225 \\ \hline 215 & | 44 \times 4 = 1776 \\ 176 & | 488 \times 8 = 3904 \\ \hline 3904 & | \\ 3904 & | \\ \hline 0 & | \end{array}$$

$$\begin{array}{l} 61504 \ | 2 \\ 30752 \ | 2 \\ 15376 \ | 2 \\ 7688 \ | 2 \\ 3844 \ | 2 \\ 1922 \ | 2 \\ 961 \ | 31 \\ 31 \ | 31 \\ 1 \ | \end{array}$$

$$248^2 = 61\,504$$

$$\begin{aligned} \sqrt{61\,504} &= \sqrt{2^6 \cdot 31^2} = \sqrt{2^6} \cdot \sqrt{31^2} = 2^3 \cdot 31 \\ &= 8 \cdot 31 = 61\,504 \end{aligned}$$

$$\begin{array}{r|l} /----- \\ \sqrt{1.69} & \mathbf{13} \\ \hline 1 & | 23 \times 3 = 69 \\ \hline =69 & | \\ 69 & | \\ \hline 0 & | \end{array}$$

$$\begin{array}{l} 169 \ | 13 \\ .13 \ | 13 \\ ..1 \ | \end{array}$$

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

$$13^2 = 169$$

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

173 è numero primo  
...

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

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

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

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

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

(\*) massimo 9 volte

$$\sqrt{288} = \sqrt{2^4 \cdot 2 \cdot 3^2} = 12\sqrt{2}$$

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

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

384	2
192	2
96	2
48	2
24	2
12	2
6	2x3
1	

/-----	
\3.84,00	<b>19,5</b>
<u>1</u>	29x9=261
284	386x6=2316
<u>261</u>	385x5=1925
2300	-----
<u>1925</u>	
375	

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

$$\sqrt{384} = \sqrt{2^6 \cdot 2 \cdot 3} = 8\sqrt{6}$$

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

/-----	
\ / 6.45	<b>25,39</b>
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		

...

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

$$\sqrt{648} = 25,45\dots$$

/-----	
\ / 6.48	<b>25,45</b>
4	46x6=276
248	45x5=225
225	504x4=2016
2300	5085x5=25425
2016	
28400	
25425	
2975	

648		2
324		2
162		2
81		3
27		3
9		3
3		3
1		

$$\sqrt{648} = \sqrt{2^2 \cdot 2 \cdot 3^4} = 18\sqrt{2}$$

$$648 = 25.45^2 + 0.2975$$

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

9.22	<b>30,364</b>
<u>9</u>	60x0=0
02.2	603x3=1809
<u>0</u>	6066x6=36396
220.0	60724x4=242896
<u>180.9</u>	
3910.0	
<u>3639.6</u>	
27040.0	
<u>24289.6</u>	
27504	

$$\begin{array}{r|l} 922 & | 2 \\ 461 & | 461 \\ \hline & 1 \end{array}$$

...

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

$$\sqrt{1296} = 36$$

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

$$\begin{array}{r|l} 1296 & | 2 \\ .648 & | 2 \\ 324 & | 2 \\ .162 & | 2 \\ ..81 & | 3 \times 3 \\ ...9 & | 3 \times 3 \\ ...1 & | \end{array}$$

$$\sqrt{1296} = \sqrt{2^4 \cdot 3^4} =$$

$$= \sqrt{2^4} \cdot \sqrt{3^4} = 2^2 \cdot 3^2 = 6^2 = 36$$

$$36^2 = 1296$$

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

\ / 15.75,00	<b>39,6</b>
<u>9</u>	69x9=621
675	786x6=4716
<u>621</u>	
5400	
<u>4716</u>	
684	

$$\begin{array}{r|l} 1575 & | 3 \\ 525 & | 3 \\ 175 & | 5 \\ 35 & | 5 \\ 7 & | 7 \\ 1 & \end{array}$$

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

$$39,6^2 + 6,84 = 1575$$

$$\sqrt{3750}^{0,01} = 61,23$$

/-----	
\ / 37.50,0000	<b>61,23</b>
36	121x1=121
150	1222x2=24444
121	12243x3=36729
2900	
2440	
45600	
36729	
8871	

3750	2x5
375	5
75	5
15	5
3	3
1	

$$\sqrt{3750} = \sqrt{2 \cdot 3 \cdot 5^4} = 25\sqrt{6}$$

$$61,23^2 + 0,8871 = 3750$$

$$\sqrt{9216} = 96$$

/-----	
\ / 92.16	<b>96</b>
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	

$$96^2 = 9216$$

$$\begin{aligned} \sqrt{9216} &= \sqrt{2^{10} \cdot 3^2} = \\ &= \sqrt{2^{10}} \cdot \sqrt{3^2} = 2^5 \cdot 3 = 96 \end{aligned}$$

$$\sqrt{11025}$$

/-----	
\ / 1.10.25	<b>105</b>
1	20x0=0
=10	
0	205x5=1025
1025	
1025	
0	

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

$$105^2 = 11025$$

$$\begin{aligned} \sqrt{11025} &= \sqrt{3^2 \cdot 5^2 \cdot 7^2} = \\ &= \sqrt{3^2} \cdot \sqrt{5^2} \cdot \sqrt{7^2} = 3 \cdot 5 \cdot 7 = 105 \end{aligned}$$



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

/-----	
\ / 6.15.04	<b>248</b>
4	4 <b>5</b> × <b>5</b> =225 (*)
21 <b>5</b>	2 <b>4</b> × <b>4</b> =176
176	-----
390 <b>4</b>	4 <b>88</b> × <b>8</b> =3904
3904	
329×9=2961 (*)	
0	

(\*) massimo 9 volte

VERIFICO  
 $61504 = 248^2$

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

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

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

/-----	
\ / 21.57.29,00.00	<b>464,46</b>
16	86×6=516
55 <b>7</b>	924×4=3696
516	9284×4=37136
412 <b>9</b>	92886×6=557316
3696	
4330 <b>0</b>	
37136	
61640 <b>0</b>	
557316	
59084	

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

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

/-----	
\ / 30.72.15,00.00	<b>554,26</b>
25	105x5=525
572	1104x4=4416
525	11082x2=22164
4715	110846x6=665076
4416	
1990	
22164	
77360	
665076	
108524	

$$554,26^2 + 10,8524 = 217215$$

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

/-----	
\ / 35.97.77,00.00	<b>599,81</b>
25	109x9=981
1097	1189x9=10701
981	11988x8=95904
11677	119961x1=119961
10701	
9760	
95904	
16960	
119961	
49639	

$$599,81^2 + 4,9639 = 359777$$

$$\sqrt{198025} = 445$$

/-----	
\ / 19.80.25	<b>445</b>
16	84x4=336
380	885x5=4425
336	
4425	
4425	
0	

198025	5
39605	5
7921	89
89	89
1	

$$\begin{aligned} \sqrt{198025} &= \sqrt{5^2 \cdot 89^2} = \\ &= \sqrt{5^2} \cdot \sqrt{89^2} = 5 \cdot 89 = 445 \end{aligned}$$

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

/-----	
\ / 1,84	<b>1,3</b>
1	24x4=96
=84	23x3=69
69	
15	

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

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

/-----	
\ / 1,84.00	<b>1,35</b>
1	24x4=96
=84	23x3=69
69	265x5=1325
1500	
1325	
175	

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

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

52.99,84	<b>72,8</b>
49	142x2=284
39.9	1448x8=11584
28.4	
1158.4	
1158.4	
0	

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

7.34,41	27,1
4	49x9=441
33.4	48x8=384
32.9	47x7=329
54.1	541x1=541
54.1	
0	

$$\sqrt{8,067}^{0,001} = 2,84024\dots$$

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

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

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

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

$\begin{array}{r} /----- \\ \backslash / 14,46.66.66 \\ 9 \\ \hline 546 \\ 544 \\ \hline 266 \\ 0 \\ \hline 26666 \\ 22809 \\ \hline 3857 \end{array}$	$\begin{array}{l}   3,803 \\   69 \times 9 = 621 \\   68 \times 8 = 544 \\   760 \times 0 = 0 \\   7603 \times 3 = 22809 \end{array}$
--	---

$$3,803^2 + 0.003857 = 14,4(6)$$

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

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

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

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

$$7,29^2 + 0.0659 = 53,21$$

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

$\begin{array}{r} /----- \\ \backslash / 5,97.20 \\ 4 \\ \hline 197 \\ 176 \\ \hline 2120 \\ 1936 \\ \hline 184 \end{array}$	$\begin{array}{l}   2,44 \\   44 \times 4 = 176 \\   484 \times 4 = 1936 \end{array}$
--	---

$$2,44^2 + 0.0184 = 5,972$$

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

$\sqrt[0,001]{0,57.14.00}$	<u>0,755</u>
$\frac{49}{814}$	$\frac{145 \times 5 = 725}{1505 \times 5 = 7525}$
$\frac{725}{890}$	
$\frac{7525}{1375}$	

$$0,755^2 + 0.001375 = 0,5714$$

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

$\sqrt[0,01]{0,28.58}$	<u>0,53</u>
$\frac{25}{358}$	$\frac{103 \times 3 = 309}{}$
$\frac{309}{49}$	

$$0,53^2 + 0.0049 = 0,2858$$

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

$\sqrt[0,01]{7,50.00}$	<u>2,73</u>
$\frac{4}{350}$	$\frac{48 \times 8 = 384}{47 \times 7 = 329}$
$\frac{329}{2100}$	$\frac{543 \times 3 = 1629}{}$
$\frac{1629}{471}$	

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

$$\sqrt{7,7500}^{0,01} = 2,78$$

$\sqrt[0,01]{7,75.00}$	<u>2,78</u>
$\frac{4}{375}$	$\frac{47 \times 7 = 329}{548 \times 8 = 4384}$
$\frac{329}{4600}$	
$\frac{4384}{216}$	

$$2,78^2 + 0.0216 = 7,75$$

$$\sqrt{2,(45)}^{0,01} = 1,56$$

$\sqrt[0,01]{2,45.45}$	<u>1,56</u>
$\frac{1}{145}$	$\frac{25 \times 5 = 125}{306 \times 6 = 1836}$
$\frac{125}{2045}$	
$\frac{1836}{209}$	

$$\sqrt{4,5}^{0,01} = 2,12$$

$\sqrt[0,01]{4,50.00}$	<u>2,12</u>
$\frac{4}{=50}$	$\frac{41 \times 1 = 41}{422 \times 2 = 844}$
$\frac{41}{900}$	
$\frac{844}{56}$	

$$\sqrt{1,2045}^{0,01} = 1,09$$

/-----	
$\sqrt{1,20.45.00}$	<u><b>1,09</b></u>
<u>1</u>	<u>20x0=0</u>
20	<u>209x9=1881</u>
00	
2045	
<u>1881</u>	
164	

$$1,09^2 + 0.00164 = 1,2045$$

$$\sqrt{1,2916}^{0,01} = 1,13$$

/-----	
$\sqrt{1,29.16}$	<u><b>1,13</b></u>
<u>1</u>	<u>21x1=21</u>
29	<u>223x3=669</u>
21	
816	
<u>669</u>	
147	


$$1,13^2 + 0.0147 = 1,2916$$


$$\sqrt{5,25}^{0,001} = 2,291$$


/-----	
$\sqrt{5,25.00.00}$	<u><b>2,291</b></u>
<u>4</u>	<u>43x3=129</u>
125	<u>42x2=84</u>
84	<u>449x9=4041</u>
4100	<u>4581x1=4581</u>
<u>4041</u>	
5900	
<u>4581</u>	
1319	


$$2,291^2 + 0.001319 = 5,25$$


## Keywords

 *Matematica, Aritmetica, espressioni, numero irrazionale, irrazionali, numero reale, elevamento a potenza, base, esponente, potenza, proprietà delle potenze, estrazione di radice quadrata, radicali, estrazione di radice, radice quadrata, quadrati perfetti, radice quadrata a mano, I, radq()*

 *Math, Arithmetic, Expression, Irrational number, Real number, Arithmetic Operations, Raise to a Power, base, exponent, power, Solved expressions with raise to a power, square root, roots,  $\text{sqr}()$ ,  $\text{sqrt}()$*

 *Matemática, Aritmética, potencia, expresiones, potencias, propiedades de las potencias, Potencias y expresiones, Raíz, Raíz cuadrada*

 *Mathématique, Arithmétique, Expression, Exercices de calcul et expression avec des puissances, propriété des puissances, Racine, Racine carrée*

 *Mathematik, Arithmetik, Potenz, Rechenregeln, Allgemeinere Basen, Allgemeinere Exponenten, Radizierung, Quadrat-Radizierung*