

Rădăcina pătrată a unui nr. nenegativ

Def: rădăcina pătrată a nr. nenegativ a este nr. nenegativ m cu proprietatea că $m^2 = a$, și notăm $\sqrt{a} = m$.

Deci: $\sqrt{a} = m$ dacă $a \geq 0$ și $m \geq 0$ și $m^2 = a$

Ex:

$\sqrt{0} = 0$	pt. că $0^2 = 0$	$\sqrt{9} = 3$	pt. că $3^2 = 9$	$\sqrt{36} = 6$	pt. că $6^2 = 36$
$\sqrt{1} = 1$	$1^2 = 1$	$\sqrt{16} = 4$	$4^2 = 16$	$\sqrt{49} = 7$	$7^2 = 49$
$\sqrt{4} = 2$	$2^2 = 4$	$\sqrt{25} = 5$	$5^2 = 25$	$\sqrt{64} = 8$	$8^2 = 64$
$\sqrt{81} = 9$	$9^2 = 81$	$\sqrt{100} = 10$	$10^2 = 100$	$\sqrt{121} = 11$	$11^2 = 121$
$\sqrt{144} = 12$	$12^2 = 144$	$\sqrt{169} = 13$	$13^2 = 169$	$\sqrt{196} = 14$	$14^2 = 196$

$\sqrt{225} = 15, \sqrt{256} = 16, \sqrt{289} = 17, \sqrt{324} = 18 \dots$

OBS: $\sqrt{-4} = 2$, nu pt. că $2^2 = 2 \cdot 2 = 4 \neq -4$

$\sqrt{-4} = -2$, nu pt. că $(-2)^2 = (-2) \cdot (-2) = +4 \neq -4$

În gimnaziu nu extragem rădăcina pătrată din nr. negative!

Extragerea rădăcinii pătrate

$\sqrt{625} = ?$

$$\begin{array}{r} \sqrt{625} \\ 4 \quad \smile \\ \hline 225 \end{array} \left| \begin{array}{l} 25 \\ 43 \cdot 5 = 225 \end{array} \right. \Rightarrow \sqrt{625} = 25$$

$\sqrt{824464} = ?$

$$\begin{array}{r} \sqrt{824464} \\ 81 \quad \smile \quad \smile \quad \smile \\ \hline 81 \\ \hline 144 \\ \hline 14464 \\ \hline 0 \end{array} \left| \begin{array}{l} 908 \\ 810 \cdot 0 = 0 \\ \hline 1808 \cdot 8 = 14464 \end{array} \right.$$

$\sqrt{824464} = 908$

$\sqrt{737281} = ?$

$$\begin{array}{r} \sqrt{737281} \\ 64 \quad \smile \quad \smile \quad \smile \\ \hline 64 \\ \hline 978 \\ \hline 825 \\ \hline 15381 \\ \hline 15381 \\ \hline 0 \end{array}$$

$$\left| \begin{array}{l} 851 \\ 1655 = 825 \\ \hline 1709 \cdot 9 = 15381 \end{array} \right.$$

$$\sqrt{1002001} \quad \begin{array}{r} 1001 \\ \hline 20 \cdot 0 = 0 \\ \hline 200 \cdot 0 = 0 \\ \hline 2001 \cdot 1 = 2001 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ \hline = 0 \\ \hline = 20 \\ \hline 0 \\ \hline 2001 \\ \hline 2001 \\ \hline = = = = \end{array}$$

$$\sqrt{59397849} \quad \begin{array}{r} 7707 \\ \hline 47 \cdot 7 = 1029 \\ \hline 1540 \cdot 0 = 0 \\ \hline 15407 \cdot 7 = 107849 \\ \hline \end{array}$$

$$\begin{array}{r} 59 \\ \hline 49 \\ \hline 1039 \\ \hline 1029 \\ \hline = 21078 \\ \hline 0 \\ \hline 107849 \\ \hline 107849 \\ \hline = = = = \end{array}$$

$$\sqrt{64112049} \quad \begin{array}{r} 8007 \\ \hline 64 \cdot 6 = 0 \\ \hline 1600 \cdot 0 = 0 \\ \hline 16007 \cdot 7 = 112049 \\ \hline \end{array}$$

$$\begin{array}{r} 64 \\ \hline = 11 \\ \hline 0 \\ \hline 1120 \\ \hline 112049 \\ \hline 112049 \\ \hline = = = = \end{array}$$

$$\sqrt{2} = ?$$

$$\sqrt{\frac{2}{1}} \quad \frac{1}{1}$$

$$\sqrt{2} = 1 \text{ rest } 1 \quad \text{probab: } 1^2 + 1 = 1 + 1 = 2$$

$$\sqrt{2} = 1,4 \text{ rest } 0,04 \quad 1,4^2 + 0,04 = 1,96 + 0,04 = 2$$

$$\sqrt{2} = 1,41 \text{ rest } 0,0119 \quad 1,41^2 + 0,0119 = 1,9881 + 0,0119 = 2$$

$$\sqrt{2} = 1,414 \text{ rest } 0,000604$$

$$\sqrt{2,00} \quad \begin{array}{r} 1,4 \\ \hline 1 \cdot 4 = 4 \\ \hline 100 \\ \hline 96 \\ \hline = 4 \end{array}$$

$$\sqrt{2,0000} \quad \begin{array}{r} 1,41 \\ \hline 1 \cdot 4 = 4 \\ \hline 100 \\ \hline 96 \\ \hline = 400 \\ \hline 281 \\ \hline 119 \end{array}$$

$$\sqrt{2,000000} \quad \begin{array}{r} 1,414 \\ \hline 1 \cdot 4 = 4 \\ \hline 100 \\ \hline 96 \\ \hline 400 \\ \hline 281 \\ \hline 11900 \\ \hline 11296 \\ \hline = 604 \end{array}$$

$$\begin{array}{r} 1,414 \\ \hline 24 \cdot 4 = 96 \\ \hline 281 \cdot 1 = 281 \\ \hline 2824 \cdot 4 = 11296 \end{array}$$

$$\sqrt{7} = 2 \text{ rest } 3, \text{ probab } 2^2 + 3 = 4 + 3 = 7$$

$$\sqrt{\frac{7}{4}} \quad \frac{2}{3}$$

$$\sqrt{7} = 2,6 \text{ rest } 0,24, \quad 6,76 + 0,24 = 7$$

$$\sqrt{7} = 2,64 \text{ rest } 0,0304$$

$$\dots \quad 2,64^2 + 0,0304 = 6,9696 + 0,0304 = 7$$

$$\sqrt{7,00} \quad \begin{array}{r} 2,64 \\ \hline 46 \cdot 6 = 276 \\ \hline 524 \cdot 4 = 2096 \\ \hline = 2460 \\ \hline 2096 \\ \hline = 304 \end{array}$$