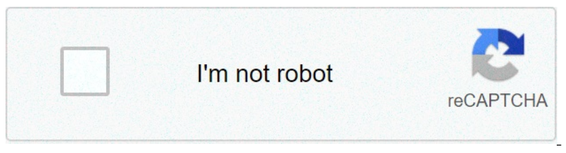

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Find the square root of 5776 by division method

Try our Mini CourseMaster Important Topics in 7 DaysLearn from IITians, NITians, Doctors & Academic ExpertsDedicated counsellor for each studentDetailed Performance Evaluationview all courses Here we will define, analyze, simplify, and calculate the square root of 5776. We start off with the definition and then answer some common questions about the square root of 5776. Then, we will show you different ways of calculating the square root of 5776 with and without a computer or calculator. We have a lot of information to share, so let's get started! Square root of 5776 definition The square root of 5776 in mathematical form is written with the radical sign like this √5776. We call this the square root of 5776 in radical form. The square root of 5776 is a quantity (q) that when multiplied by itself will equal 5776. √5776 = q × q = q2 Is 5776 a perfect square? 5776 is a perfect square if the square root of 5776 equals a whole number. As we have calculated further down on this page, the square root of 5776 is a whole number. 5776 is a perfect square. Is the square root of 5776 rational or irrational? The square root of 5776 is a rational number if 5776 is a perfect square. It is an irrational number if it is not a perfect square. Since 5776 is a perfect square, it is rational number. This means that the answer to "the square root of 5776?" will have no decimals. √5776 is a rational number Can the square root of 5776 be simplified? A square root of a perfect square can be simplified because the square root of a perfect square will equal a whole number: √5776 = 76 How to calculate the square root of 5776 with a calculator The easiest and most boring way to calculate the square root of 5776 is to use your calculator! Simply type in 5776 followed by √x to get the answer. We did that with our calculator and got the following answer: √5776 = 76 How to calculate the square root of 5776 with a computer If you are using a computer that has Excel or Numbers, then you can enter SQRT(5776) in a cell to get the square root of 5776. Below is the result we got: SQRT(5776) = 76 What is the square root of 5776 written with an exponent? All square roots can be converted to a number (base) with a fractional exponent. The square root of 5776 is no exception. Here is the rule and the answer to "the square root of 5776 converted to a base with an exponent?": √b = b½ √5776 = 5776½ How to find the square root of 5776 by long division method Here we will show you how to calculate the square root of 5776 using the long division method. This is the lost art of how they calculated the square root of 5776 by hand before modern technology was invented. Step 1) Set up 5776 in pairs of two digits from right to left: Step 2) Starting with the first set: the largest perfect square less than or equal to 57 is 49, and the square root of 49 is 7. Therefore, put 7 on top and 49 at the bottom like this: Step 3) Calculate 57 minus 49 and put the difference below. Then move down the next set of numbers. Step 4) Double the number in green on top: 7 × 2 = 14. Then, use 14 and the bottom number to make this problem: 14? × ? ≤ 876 The question marks are "blank" and the same "blank". With trial and error, we found the largest number "blank" can be is 6. Replace the question marks in the problem with 6 to get: 146 × 6 = 876. Now, enter 6 on top, and 876 at the bottom: The difference between the bottom two numbers is zero, therefore, you are done! The answer is the green numbers on top. Once again, the square root of 5776 is 76. Square Root of a Number Please enter another number in the box below to get the square root of the number and other detailed information like you got for 5776 on this page. Notes Remember that negative times negative equals positive. Thus, the square root of 5776 does not only have the positive answer that we have explained above, but also the negative counterpart. We often refer to perfect square roots on this page. You may want to use the list of perfect squares for reference. Square Root of 5777 Here is the next number on our list that we have equally detailed square root information about. Copyright | Privacy Policy | Disclaimer | Contact Find the square root of each of the following numbers by division method. (i) \(2304 \) (ii) \(4489 \) (iii) \(3481\) (iv) \(529\) (v) \(3249\) (vi) \(1369 \) (vii) \(5776\) (viii) \(7921\) (ix) \(576\) (x) \(1024\) (xi) \(900\) (xii) \(900\) What is Known? Perfect squares What is unknown? Square root by using division method. Reasoning: When a number is large, even the method of trading the square root by prime factorization becomes lengthy and difficult, so the division method is used. Steps (i) The square root of \(2304\) is calculated as follows Since remainder is zero and number of digits and left in the given number. Therefore, \(\sqrt {2304}= 48 \) (ii) The square root of \(4489\) is calculated as follows. \[\begin{align}\sqrt {4489} &= 67\end{align}\] (iii) The square root of \(3481\) is calculated as follows. \(\sqrt {3841}= 59\) (iv) The square root of \(529\) is calculated as follows. \[\sqrt {529}= 23\] (v) The square root of \(3249\) is calculated as follows. \[\sqrt {3249}= 57\] (vi) The square root of \(1369\) is calculated as follows. \[\sqrt {1369}= 37\] (vii) The square root of \(5776\) is calculated as follows. \[\sqrt {5776}= 146\] (viii) The square root of \(7921\) is calculated as follows. \[\sqrt {7921}= 89\] (ix) The square root of \(576\) is calculated as follows. \[\sqrt {576}= 24\] (x) The square root of \(1024\) is calculated as follows. \[\sqrt {1024}= 32\] (xi) The square root of \(3136 \) is calculated as follows. \[\sqrt {3136}= 56\] (xii) The square root of \(900 \) is calculated as follows. \[\sqrt {900}= 30\] Find the number of digits in the square root of each of the following numbers (without any calculation). (i) \(64\) (ii) \(144\) (iii) \(4489\) (iv) \(27225\) (v) \(390625\) What is known? Squares What is unknown? Number of digits in square root Reasoning: If a perfect square is of n digits then it's square root will have \(\begin{align}\frac{n}{2}\end{align}\) digits, if n is even and \(\begin{align}\frac{\left({n + 1} \right)}{2}\end{align}\) if \(n\) is odd Steps (i) \(64\) \(n = 2 \rm{even} \) \(\begin{align}{\rm{Number}}\;{\rm{of}}\;{\rm{digits}} = \frac{2}{2} = 1\end{align}\) (ii) \(144\) \(n = 3\) \(\begin{align}{\rm{Number}}\;{\rm{of}}\;{\rm{digits}} &= \frac{{n + 1}}{2}\\ &= \frac{{3 + 1}}{2} \\&= \frac{4}{2} = 2\end{align}\) (iii) \(4489\) \(n = 4\) \(\begin{align}{\rm{Number}}\;{\rm{of}}\;{\rm{digits}} = \frac{n}{2} = \frac{4}{2} = 2\end{align}\) (iv) \(27225 \) \(n = 5\) \(\begin{align}{\rm{Number}}\;{\rm{of}}\;{\rm{digits}} &= \frac{{n + 1}}{2}\\ &= \frac{{5 + 1}}{2} \\&= \frac{6}{2} = 3\end{align}\) (v) \(390625 \) \(n = 6\) \(\begin{align}{\rm{Number}}\;{\rm{of}}\;{\rm{digits}} = \frac{n}{2} = \frac{6}{2} = 3\end{align}\) Find the square root of the following decimal numbers. (i) \(2.56\) (ii) \(7.29\) (iii) \(51.84\) (iv) \(42.25\) (v) \(31.36\) What is known? Perfect squares in decimal form What is unknown? Square root by using division method Reasoning: To find the square root of decimal numbers put bars on the integral part of the number and place bars on the decimal part on every pair of digits starting with the first decimal place. Steps: (i) Square root of \(2.56\) is calculated as:- \[\sqrt {2.56}= 1.6\] (ii) Square root of \(7.29\) is calculated as \[\sqrt {7.29}= 2.7\] (iii) Square root of \(51.84\) is calculated as \[\sqrt {51.84}= 7.2\] (iv) Square root of \(42.25\) is calculated as follows \[\sqrt {42.25}= 6.25\] (v) Square root of \(31.36 \) is calculated as follows \[\sqrt {31.36}= 5.6\] Find the least number which must be subtracted from each of the following numbers so as to get a perfect square. Also find the square root of the perfect square so obtained. (i) \(402\) (ii) \(1989\) (iii) \(3250\) (iv) \(825\) (v) \(4000\) What is known? Numbers that are not perfect square What is unknown? What must be subtracted from the numbers so as to get perfect square Steps (i) Square root of \(402\) is calculated as: It is evident that square of \(20\) is less than \(402\) by \(2\). If we subtract the remainder from the number, we get a perfect square. Therefore, the required perfect square is Therefore, required perfect square \(= 402 − 2 = 400\) \(402 - 2 = 400\; {\rm{and}}\;\sqrt {400}= 20\) (ii) Square root of \(1989\) by long division method. The remainder obtained is \(53\). The square of \(44\) is less than the given number \(1989\) by \(53\). Therefore, perfect square can be obtained by subtracting \(53\) from the given number \(1989\). Therefore, required perfect square \(= 1989 − 53 = 1936\) \({\rm{And}}\;\sqrt {1936}= 44\) (iii) Square root of \(3250\) can be calculated by long division method as follows The remainder obtained is \(1\). The square of \(57\) is less than \(3250\) by \(1\). Therefore, the required perfect square \(= 3250 − 1 = 3249\) \({\rm{And}}\;\sqrt {3249}= 57\) (iv) Square root of \(825\) can be calculated by the long division method as follows The remainder is \(41\).it shows that the square of \(28\) is less than \(825\) by \(41\). Therefore, required perfect square \(= 825 − 41 = 784\) \({\rm{}}\;\sqrt {784}= 28\) (v) Square root of \(4000\) can be calculated by the long division method as follows. The remainder is \(31\), it represents that the square of \(63\) is less than \(4000\) by \(31.\) Therefore, the square perfect square \(= 4000 − 31 = 3969\). \(\sqrt {3969}= 63\) Find the least number which must be added to each of the following numbers so as to get a perfect square. Also find the square root of the perfect square so obtained. (i) \(525\) (ii) \(1750\) (iii) \(252\) (iv) \(1825 \) (v) \(6412\) What is known? Numbers that are not perfect square What is unknown? What must be added to the numbers so as to get perfect square Steps: (i) Square root of \(525\) is calculated by long division method as follows. It is evident that \({22^2} < 525\) Next, the perfect square of \(23 \) is \({23^2} = 529\) Hence, the number to be added to \(529\) \[\begin{align}&= {23^2} - 525\\&= 529 - 525\\&= 4\end{align}\] The required perfect square is \(525 + 4 = 529\) \(\sqrt {529}= 23\) (ii) Square root of \(1750 \) can be calculated by the long division method as follows. The remainder is \(69\). This shows that \({41^2} < 1750\) Next perfect square is \({42^2} = 1764\) Hence number to be added to \(1750 \) \[\begin{align}&= {42^2} - 1750\\&= 1764 - 1750\\&= 14\end{align}\] The required perfect square is \(1750 + 14 = 1764 \) \(\sqrt {1764}= 42\) (iii) Square root of \(252\) is calculated as follows. The remainder is \(27.\) This shows that \({15^2} < 252\) Next perfect square is \({16^2} = 256\) Hence number to be added to \(252 \) \[\begin{align}&= {16^2} - 252\\&= 256 - 252\\&= 4\end{align}\] The required perfect square is \(252 + 4 = 256\) \({\rm{}}\;\sqrt {256}= 16\) (iv) Square root of \(1825\) is calculated as follows. The remainder is \(61.\) This shows that \({42^2} < 1825\) Next perfect square is \({43^2} = 1849\) Hence number to be added to \(1825 \) \[\begin{align}&= {43^2} - 1825\\&= 1849 - 1825\\&= 24\end{align}\] The required perfect square is \(1825 + 24 = 1849\) \({\rm{And}}\;\sqrt {1849}= 43\) (v) Square root of \(6412 \) is calculated as follows. \({80^2} < 6412\)The remainder is \(12. \)This shows that Next perfect square is \({81^2} = 6561\) Hence number to be added to \(6412\) is \[\begin{align}&= {16^2} - 252\\&= 256 - 252\\&= 4\end{align}\] The required perfect square is \(6412 + 149 = 6561 \) \({\rm{And}}\;\sqrt {6561}= 81\) Find the length of the side of a square whose area is \(441\;\rm{m^2}\) . What is known? Area of the square What is unknown? Length of the side of a square Reasoning: Since, area of a square is equals to square of its side. The length of the side can be calculated by finding the square root of the area. Steps: Area of the square = side of a square x side of a square \[\begin{align}441\;\rm{m^2} = \text{side of a square}^2\end{align}\] \({\text{Side of a square}} = \;\sqrt {441}= 21\;{\rm{m}}\) In a right triangle \(\rm{}ABC\), \(\rm{}\angle B = 90°\). (i) If \(AB = 6 \,\rm{ cm}\)\(\), \(BC = 8\, \rm{cm}\)\(\), find \(AC\) (ii) If \(AC = 13\,\rm{cm},\) \(\ \(BC = 5 \,\rm{cm} \)\(\), find \(AB \) What is known? Two sides right triangle What is unknown? One side of the given triangle Reasoning: In a right-angle triangle if two sides are given then third side can be calculated using the Pythagoras theorem. Steps: (i) \(AB = 6\;\rm{cm}\) \(BC = 8\;\rm{cm} \) \(AC=\) ? According to Pythagoras theorem \[\begin{align}{\rm{A}}{{\rm{C}}^{\rm{2}}}\;{\rm{ }}&= \;{\rm{A}}{{\rm{B}}^{\rm{2}}}\;{\rm{ + }}\;{\rm{B}}{{\rm{C}}^{\rm{2}}}\\{\rm{A}}{{\rm{C}}^{\rm{2}}}\;{\rm{ }}&= \;{{\rm{6}}}^{\rm{2}}}\;{\rm{ + }}\;{{\rm{8}}}^{\rm{2}}}\\{\rm{A}}{{\rm{C}}^{\rm{2}}}\;{\rm{ }}&= \;{\rm{100}}\\\;\sqrt {{\rm{100}}} \\\;\sqrt {AC}\;{\rm{ }}&= \;\sqrt {{\rm{100}}} \\\;\sqrt {AC}\;{\rm{ }}&= \;{\rm{10}}\;{\rm{cm}}\end{align}\] (ii) \(AC = 13\;\rm{cm} \) , \(BC = 5\;\rm{cm}\) , \(AB \)=? According to Pythagoras theorem \[\begin{align}{\rm{A}}{{\rm{C}}^{\rm{2}}}\;{\rm{ }}&= \;{\rm{A}}{{\rm{B}}^{\rm{2}}}\;{\rm{ + }}\;{{\rm{(13)}}}^{\rm{2}}}\;{\rm{ }}&= \;{\rm{A}}{{\rm{B}}^{\rm{2}}}\;{\rm{ + }}\;{{\rm{(5)}}}^{\rm{2}}}\\{\rm{169}}\;{\rm{ }}&= \;{\rm{A}}{{\rm{B}}^{\rm{2}}}\;{\rm{ + }}\;{\rm{25}}\\{\rm{A}}{{\rm{B}}^{\rm{2}}}\;{\rm{ }}&= \;{\rm{169}} - {\rm{25}}\;{\rm{ }}=\;{\rm{144}}\\{\rm{AB}}\;{\rm{ }}&= \;\sqrt {{\rm{144}}} \;{\rm{ }}= \;{\rm{12}}\;{\rm{cm}}\end{align}\] A gardener has \(1000 \) plants. He wants to plant these in such a way that the number of rows and the number of columns remain same. Find the minimum number of plants he needs more for this. If number of rows and number of columns are equal then number of plants has to be a perfect square What is known? Number of plants. What is unknown? Minimum number of more plants to make the number of rows and number of columns same. Reasoning: If number of rows and number of column are equal then number of palant has to be a prefect square. Steps: Number of plants \(= 1000 \) The square root of \(1000 \) can be calculated by long division method. The remainder is \(39.\) It shows that \({31^2} < 1000\) The square of \(32 \) is \(1024\) Hence number to be added to \(1000\) to make it perfect square .\[\begin{align} &= {32^2} - 1000\\ &= 1024 - 1000\\ &= 24 \end{align} \] Thus, the required number of plants \(=24\) There are \(500\) children in a school. For a P.T. drill they have to stand in such a manner that the number of rows is equal to number of columns. How many children would be left out in this arrangement? Here, we have to find the number which should be subtracted from total number of children to make it a perfect square. What is known? Number of children in a school. What is unknown? Number of children would be left out in PT drill. Reasoning: Here, we have to find the number which should be subtracted from total number of children to make it a prefect square. Steps: Number of children in a school \(= 500 \) The square root of \(500 \) can be calculated using long division method. The remainder is \(16\). It shows that \({22^2}\) is less than \(500\). Therefore, perfect square can be obtained by subtracting \(16\) from the given number. Therefore, required perfect square is \[\begin{align}&= 500 - 16\\&= 484\end{align}\] \({\rm{And}}\;\sqrt {484}= 22\) Number of children left out in PT drill arrangement \(= 16\)