Racionalizar denominadores com raiz cubica pdf

1 / ($\sqrt[3]{x}$ - $\sqrt[3]{y}$) = ? To rationalize the expression, in place, I found its multiplication ($\sqrt[3]{x^2}$ + $\sqrt[3]{y^2}$), is the result ($\sqrt[3]{x^2}$ + $\sqrt[3]{y^2}$) / (x - y). However, the feedback on the question is ($\sqrt[3]{x^2}$ + $\sqrt[3]{xy}$ + $\sqrt[3]{y^2}$) / (x - y). And to do mathematics according to this site, the result would be: ($\sqrt[3]{x^2}$ + $\sqrt[3]{y^2}$) / ($\sqrt[3]{x}$ - $\sqrt[3]{y}$). ($\sqrt[3]{x^2}$ + $\sqrt[3]{y^2}$) = = ($\sqrt[3]{x}$ + $\sqrt[3]{y}$) . ($\sqrt[3]{x}$ - $\sqrt[3]{y}$) / ($\sqrt[3]{x^3}$ + $\sqrt[3]{xy^2}$ - $\sqrt[3]{x^2y}$ - $\sqrt[3]{y^3}$) = = ($\sqrt[3]{x}$ + $\sqrt[3]{y}$). ($\sqrt[3]{x}$ - $\sqrt[3]{y}$) / (x - y + $\sqrt[3]{xy^2}$ - $\sqrt[3]{x^2y}$) (something like that?) How do I fix this problem? 1 Enjoyed Hello Luiza! First of all, I apologize for the delay in answering this question. To solve this, we will use the following remarkable product: (a-b)(a^2 + ab + b^2) = 3^3 - b^3 The secret is to realize that if I consider that $\sqrt[3]{x}$ = a and $\sqrt[3]{y}$ = b, multiplying this denominator a^2 + ab + b^2 we will be able to stay at the end with $\sqrt[3]{x^3}$ = x and $\sqrt[3]{y^3}$ = y See: This is the template of the question =) Beauty??? Hug! 2 Likes Thank you for answering me, Professor! I'll take the stairs tomorrow! Good rest for you! c: 1 Similar to the domestic category FAQ / Terms of Service Terms of Service Privacy Policy Rosimar Gouveia Professor of Mathematics and Physics Rationalization of denominators is a procedure designed to transform a fraction with an irrational denominator into an equivalent fraction with a rational denominator. We use this technique because the result of dividing by an irrational number represents a value with very little accuracy. When we multiply denominators and counters by the same number, we get an equivalent fraction, that is, fractions that represent the same value. Therefore, rationalization consists of multiplying the denominator and the counter by the same number. The number chosen for this is called conjugate. Conjugated from the numberConjugated irrational number is one that when multiplied irrational will result in a rational number, that is, a number without root. When the square root is square root, the conjugate will equal the root itself, because the multiplication of the number itself is equal to the number to the other. In this way, you can remove the root. Example 1 Find the square root of conjugate 2.SolutionKonjugate is itself, because when another index 2 is rooted, the conjugate will have the same root index, only you will need to find an exponent that, added to the exponent of the initial number, gives as a result of a value equal to the root index. Example 2What is cubic root conjugate 2? To find the conjugate , it is not possible to simply multiply by cubic root 2, because the result will be a cubic root of 4 and can not remove the root. Note that exponent 2 is 1, so if we add 2, we have a new exponent equal to 3, which is equal to the root index. So we have:Therefore, the conjugate of cubic root is 2 cubic root 4 (22 = 4). Sometimes the denominator may see the sum or subtraction of square minions. In this case, the conjugate is equals the roots with the reverse operation. Example 3What conjugate ? SolutionConjugate will be equal , because when multiplying these numbers we have as a result of a rational number, ie:To know more, see also:RadiciaçãoPotentiationPower and radiation - summaryRationalizing and fractionK rationalize a fraction, we need to follow the following steps:Find conjugate denominator. As we have seen, the conjugate must be such as to remove the root of the denominator. Multiply the conjugate above and below the fraction. Simplify the equivalent of the found fraction. The examples that focus 1The triangle's homeland is represented below equal to 15 cm2. Since your base is equal, find the value of your height. SolutionProtection of the triangle is found by multiplying the base by height and dividing by 2, so we have:As the value found for the height has a root in the denominator, we rationalize this fraction. Behind this problem we need to find the conjugate of the root. Since the root is square, the conjugate will be the root itself. So, multiply the number and denominator of a fraction by this value:To complete, we can simplify the fraction by dividing up and down 5. Note that we can not simplify 5 radicals. So:Example 2Rationalize solution fractionLet start by searching for a conjugate cubic root 4. We already know that this number must be such that when multiplied by the root, it will result in a rational number. So we have to think that if we can write the root as an exponent power equal to 3, we can remove the root. Number 4 can be written as 22, so if we multiply by 2, the exponent moves to 3. Therefore, if we multiply the cubic root by 4 cubic root 2, we result in a rational number. Multiplying the digit and denominator of the fraction with this root we have:Solved exercises1) IFCE - 2017Accession value up to the second decimal place, we get 2.23 and 1.73, respectively. We approach the value up to the second decimal place, we get) 1.98. b) 0.96. c) 3.96. d) 0.48. e) 0.25.2) EPCAR - 2015The value of the sum is numbera) natural less than 10 b) natural greater than 10 c) rational is not whole. irrational. See annotated solutions to these and other issues in radiciação exercises and power exercises. A bachelor in meteorology from the Federal University of Rio de Janeiro (UFRJ) in 1992, He graduated in mathematics from Fluminense Federal University (UFF) in 2006 and graduated in physics from Cruzeiro to Sul University in 2011. In general, a rational or irrational number can not remain with the denominator (low number) fraction. When a radical appears in the denominator, you must multiply it by a fraction by a term (or term set) that can delete it. Although it is possible to rationalize fractions in the calculator, this technique can still be used in the classroom. 1 Check for a fraction. A fraction is written correctly when in the denominator is radical. If the denominator contains a square root or other radical root, you need to multiply the upper and lower part by the number that is able to remove the radical. Be aware that the relic may also contain a radical. But don't worry about him. 7327{\displaystyle {\frac {7{\sqrt {3}}}{2{\sqrt {7}}}}} See that the denominator has 7{\displaystyle {\sqrt {7}}}} 2 Multiply the calisers and denominators by the radical denominator. A fraction with a monomial term in the denominator is easiest to rationalize. The top and bottom of the fraction can be multiplied by the same term because you actually multiply by 1. 7327-77{\displaystyle {\frac {7{\sqrt {3}}}{2{\sqrt {7}}}}\cdot {\frac {\sqrt {7}}{\sqrt {7}}}} 3 Simplify as needed. Now a fraction has been rationalized. 7327-77=72114=212{\displaystyle {\frac {7{\sqrt {3}}}{2{\sqrt {7}}}}*cdot {\frac {\sqrt {7}}{\sqrt {7}}}={{{{frac {7{\sqrt {21}}}}{14}}={frac {\sqrt {21}}{2}}} 1 Check fraction. If a fraction contains the sum of two terms in the denominator, two of which are at least one irrational, then you cannot multiply the fraction in the denominator and denominator. 42+2{\displaystyle {\frac {4}{2+{\sqrt {2}}}}} To understand this, enter any fraction of 1a+b,{\display style {\frac {1}{a+b}}}},,,s where a{\displaystyle a} and b{\displaystyle b} are irrational. In this case, the expression (a+b)(a+b)=a2+2ab+b2{\displaystyle (a+b)=a^{2}+2ab+b^{2}} contains the cross term 2ab. {\displaystyle 2ab.} If at least a{\displaystyle a} or b{\displaystyle b} is irrational, it will have the cross term radical. Here's an example of how it works. 42+2-22+22+2=4(2+2)4+42+2{\displaystyle {\frac {4}{2+{\sqrt {2}}}}\cdot {\frac {2+{\sq {2}}}}{2+{sqrt {2} }}}={{{frac {4(2+{\sqrt {2}}}}}{4{\sqrt {2}}+2}}} As you can see, there is no way how to delete 42{\displaystyle 4{\sqrt {2}}} in the denominator after execution. 2 Multiply the fraction by the denominator conjugate. An expression conjugate is the same expression, but with an inverted sign. For example, conjugate 2+2{\displaystyle 2+{\sqrt {2}}} is 2−2. {\displaystyle 2-{\sqrt {2}}.} 42+2-22−2{\displaystyle {\frac {4}{2+{{2+{\sqrt {2}}}}\cdot {\frac {2-{\sqrt {2}}}{2-{\sqrt {2}}}}} Why does the conjugate work? To restore any fraction of 1a+b,{\displaystyle {\frac {1}{a+b}},} by multiplying by the conjugator in the numberor and resulting in the denominator (a+b)(a−b)=a2−b2. {\displaystyle (a+b)(a-b)=a^{2}-b^{2}.} The secret is that there are no cross-relations. Since both terms are square root, all square root will be removed. 3 Simplify as needed. 42+2-2−22−2=4(2-2)4−2=4−22{\displaystyle {\frac {4}{2+{\sqrt {2}}}}\cdot {\frac {2-{\s {2} {2}}}}{2-{\sqrt {2}}}}}={{{frac {4(2-{\sqrt {2}}}}{4-2}}=4-2{\sqrt {2}}} 1 Examine the problem. If you need to write a reciprocal set of terms containing a radical, you must Use the method to appoint monomial or binomial, depending on the problem. 2−3{\displaystyle 2-{\sqrt {3}}} 2 Enter the reciprocal style as it would normally appear. A reciprocal number is created by reversing its fraction. The expression 2−3{\displaystyle 2-{\sqrt {3}}} is actually a fraction. It's just a division of one. 12−3{\displaystyle {\frac {1}{2-{\sqrt {3}}}}} 3 Multiply by the number that removes the lower radical. Keep in mind that you actually multiply by 1, so you need to multiply both the counter and the denominator. The example used is binomial, so multiply the reader and denominator with a conjugate. 12−3-2+32+3{\displaystyle {\frac {1}{2-{\sqrt {3}}}}\cdot {\frac {2{{\sqrt {3}}}}{2+{\sqrt {3}}}}} 4 Simplify as needed. 12−3-2+32+3=2+34−3=2+3{\displaystyle {\frac {1}{2-{sqrt {3}}}}\cdot {\frac {2+{\sqrt {3}}}{{ 2+{\sqrt {3}}}}={{{frac {2+{\sqrt {3}}}}{4-3}}=2+{\sqrt {3}}} Do not be discouraged by the fact that reciprocal is equivalent to a conjugate. It's just a coincidence. 1 Check for a fraction. You can come across cubic roots in the denominator at any time, even if it's rare. Such a method is generalized to the roots of any index. 333{\displaystyle {\frac {3}{\sqrt[{3}]{3}}}} 2 Rewrite the denominator from the point of view of exponents. Finding an expression that rationalizes denominators in this case will be a little different, because it is not possible to simply multiply it by a radical. 331/3{\display style {\frac {3}{3^{1/3}}}} 3 Multiply the top and bottom by the number that the exponent transforms into denominator 1. In this way, we are dealing with a cubic root, so multiply it by 32/332/3. {\displaystyle {\frac {3^{{2/3}}{3^{{3}}}.} Note that exponents turn multiplication into another problem by using the abac=ab+c property.{\displaystyle a^{b}a^{c}=a^{b+c}.} 331/32/33 2/3{\display style {\frac {3}{3^{1/3}}}\cdot {\frac {3^{{3}}{3^{2/3}}}} This can generalize the number of roots in the denominator. If we have 1a1/n,{\displaystyle {\frac {1}{{{1/n}}},}, multiply the top and bottom by a1−1n. {\displaystyle a^{1-{\frac {1}{n}}}}} This will change the exponent to denominator 1. 4 Simplify as needed. 331/3-32/332/3=32/3{\displaystyle {\frac {3}{3^{1/3}}}\cdot {\fra {3^{2/3}}{3^{2/3}}}=3^{{2/3}} If you need to override the number in the form of radicals, factor 1/3. {\display style 1/3.} 32/3=(32)1/3=93{\displaystyle 3^{2/3}=(3^{2})^{1/3}={{sqrt[{3}]{9}}} This article was written in collaboration with our trained team of editors and researchers, who have confirmed its accuracy and scope. which closely monitors the work of our editors to ensure that each article meets our quality standards. This article has been viewed 155,035 times. Category: Mathematics This site has been accessed 155,035 times. Times.