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Rational expressions examples with answers

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(Pixels\0 frac {{{x^2} + 5x-24}}{{{x^2} + + 6x + 8}}\\, \centerdot \, \ frac {{x ^2} + 4x + 4}}{{{x^2} \ (Pixels\0 frac {{{x^2}-49}}{{2{x^2}-3x-5}} div \frac {{{x^2} - x-42}}{{x^2} + 7x +6}\}) Solution \0 \frac {{x^2} - 2x - 8}}{2{2{x^2} - 8x - 24}}\^^^-24}}Div\2} Div {{x^2} - 9x + 20}}{{x^2} - 11x + 30 }\) Solution \\\20} Displaystyle \frac {{\0 DisplayStyle \0 frac{3} {{x + 1}}}}{{\ Displaystyle \frac {{x+4}}{{{x^2} + 11x}}}}}}}}}}}}}}}}) Solution for problems perform operations indicating 8-12. ((DisplayStyle\) frac{3} {{x-4}} + \ frac {x}{{2x+7}\} Solution \0 (Displaystyle \frac{2}{3{x^2}}}}} } -\ frac{1} {{9 {x^4}} \ frac{2} {{x+4}}\) solution \0 ((DisplayStyle\) frac {x}{{{{x^2} + 12x + 36}} - \frac {{x-8}}{{{x+6}}}\) solution \(............... {1}............... \ {{x^2} -13x + 42}} + \ frac {{x+1}}{{x-6}}-\frac{x^2}}}{{x-7}\) solution\(\displaystyle\)-13x+x+10}{{ Right)}^3}} +\0 frac {x}{{{\\left({3x+8}\}^2}}}}\) Solution Now you have to understand what rational numbers are, the next topic to look at this article is rational expression and how to simplify them. Only for your own benefit, we define a rational number as a number expressed as p/q where is not equal to zero. In other words, we can say that a rational number is nothing more than a fraction in which the numerator and denominator are integers. Examples of rational numbers are 5/7, 4/9/1/2, 0/3, 0/6 etc. On the other hand, a rational expression form is an algebraic expression of F(x)/g(x) in which the numerator or denominator is polynomial or both digits and digits are polynomial. Examples of rational expression are 5/x−2, 4/(x+1), (x+5)/5, (x2+5x+4)/(x+5), (x+1) /(x+2), (x2+x+1)/2x, etc. How to simplify rational expression? Simplification of rational expression is the process of reducing a rational expression at its lowest words. Rational expressions are simplified in the same way that numerical numbers or fractions are simple. To simplify any rational expression, we implement the following steps: both denominator and factory of rational expression. Remember to write each expression as standard. Reduce the expression by cancelling the factors remaining in the numerator and denominator. Let's simplify some of the examples shown below: Example 1Complify: (x2+ 5x + + 4) (x+5)/(x2 - 1) solutions to achieve the fatter and denominator; - (x +1) (x x + 4) (x+5) / (x+1) (x-1) Now cancel common words. - (x+4) (x+5) /(x-1) Example 2Symple (x2-4) / (x+ 5) (x2 +1) 4x + 4) SolutionFactor to get both numerator and denominator.) (x+2) (x-2) / (x + 2) (x + 2) Now get to cancel the points and common factors in the denominator.= (x-2) / 2) (x + 2) Example 3Simle rational expression x/ (x2- 4x) SolutionFactor x to get out in the denominator; On cancelling common terms in the up and down , we receive ;= 1 /(x-4) Example 4Simpulal Rational Expression (5x + 20) / 20) (7x + 28) SolutionFactor out GCF in both points and denominator;= (5x + 20) / 5x + 20) (7x + 28) ⟹ 5 (x + 4) / , we get;= 5/7Example 5Simplify the rational expression (x2 + 7x + 10) / (x2 – 4) SolutionFactor both the top and bottom of the expression.= (x2 + 7x + 10) / (x2 – 4) ⟹ (x + 5) (x + 2) / (x2 – 22)⟹ (x + 5) (x + 2) / (x + 2) (x – 2) Cancel the common terms to get;= (x + 5) / (x – 2) Example 6Simplify (3x + 9) / (3x + 15) Solution= (3x + 9) / (3x + 15) ⟹ 3(x + 3) / 3(x + 5)= (x + 3) / (x + 5) Example 7Simplify the rational expression (64a3 + 125b3) / (4a2b + 5ab2) SolutionFactor the numerator and the top;= (64a3 + 125b3) / (4a2b + 5ab2) ⟹ [(4a)3 + (5b)3] / ab (4a + 5b)⟹ (4a + 5b) [(4a)2 – (4a) (5b) + (5b)2] / ab (4a + 5b)Cancel out common terms to get;= (16a2 – 20ab + 25b2) / abExample 8Simplify the following rational expression(9x2 – 25y2) / (3x2 – 5xy) Solution= (9x2 – 25y2) / (3x2 – 5xy) ⟹ [(3x)2 – (5y)2] / x (3x – 5y)= [(3x + 5y) (3x – 5y)] / x (3x – 5y)= (3x + 5y) / xExample 9Simplify : (6x2 – 54) / (x2 + 7x + 12) Solution= (6x2 – 54) / (x2 + 7x + 12)= 6(x2 – 9) / (x + 3) (x + 4)= 6(x2 – 32) / (x + 3) (x + 4)= 6(x + 3) (x – 3) / (x + 3) (x + 4)= 6(x – 3) / (x + 4) Practice QuestionsSimplify the following rational expressions:4x3/ 8x2(4x3+ 8x2)/2x(7x2+ 28x)/ (x2 + 8x + 16) (4x2+ 4x + 1)/ (2x3 + 11x2 + 5x) (x2 + 2x – 15)/ (x2 + x – 12) (x3+ 1)/ (x2 + 7x + 6)x2 + 10x + 24/x3 – x2 – 20xx + 3/x2 + 12x + 27(x3 + 4x2 – 9x – 36)/ (4x2 + 28x + 48) (3x2 – 9xy – 12y2)/ (6x3 – 6xy2) (2x4 + 9x3 -5x2)/ (6x3 + x2 – 2x) (2x3 + 5x2 + 9)/ (2x2– x + 3) (x3 + 3x2)/2x(xy + 3x – 2y – 6)/ (y2 + y – 6) (5m2 – 57mn + 70n2)/ 2m2 – 16mn – 40n2Previous Lesson | The main page. The next lesson here are the steps needed to simplify rational expressions: Step 1: Factor both the numerator and the denominator of the fraction. Remember to write expressions in descending order, factor out a negative number if the leading coefficient is a negative number, and each expression factor is used by different factor techniques. Step 2: Fraction. To reduce the fraction, cancel the expression in the digit and denominator that are exactly the same. Step 3: Retype any remaining expressions in the digit and denominator. Example 1 - Simple: Step 1: Factor both the numerator and the denominator of the fraction. Step 2: Reduce the fraction. Step 3: Retype any remaining expressions in the digit and denominator. Example 2 - Simple: Step 1: Factor both the numerator and the denominator of the fraction. Step 2: Reduce the fraction. Step 3: Retype any remaining expressions in the digit and denominator. Click here for practice problems Example 3- Simple: Step 1: Factor both the numerator and denominator of the fraction. Step 2: Reduce the fraction. Step 3: Retype any remaining expressions in the digit and denominator. Click here for practice problems Example 4- Simple: Step 1: Factor both the numerator and the denominator of the fraction. Step 2: Reduce the fraction. Step 3: Retype any remaining expressions in the digit and denominator. Click here for practice problems Example 5- Simple: Step 1: Factor both the numerator and denominator of the fraction. Step 2: Reduce the fraction. Step 3: Retype any remaining expressions in the digit and denominator. Click here for practice problems in Chapter 1, we reviewed the parts and the properties of their operation. We introduced rational numbers, which are only fractions where digits and denominators are integers, and denominator is not zero. In this chapter, we will work with fractions whose marks and denominator are polynomial. We call these rational expressions. Remember, the partition is undefined by (0\). [Beginning {array}{cccc} {−\0 dfrac{13}{42}}&{dfrac{7y}{8z}}&{\dfrac {5x + 5x + 2}{x^2−7}}&{\dfrac {4x ^2+3x−1}{2x−8}\\\ \(−\dfrac{13}{42}\), is just a fraction. Since a stable degree is a polynomial with zero, the ratio of two constanging is a rational expression, provided the denominator is not zero. We will conduct the same operations with rational expressions that we do with fractions. We will simplify, add, subtract, multiply, divide, and use them in applications. When we work with a numeric fraction, it is easy to avoid being divided by zero, because we can see the number in the denominator. To avoid being divided by zero in a rational expression, we should not allow variable values that will make the denominator zero. If the denominator is zero, the rational expression is undefined. The numeral of rational expression \(0\)-but cannot be a denominator. So before we begin any operation with a rational expression, we have to examine it first to find values that will make the denominator zero. In this way, when we solve a rational equation for example, we will know whether the algebraic solutions we find are allowed or not. Definition: Determine the values for which rational expression is undefined. Set the denominator To zero. Solve the equation in the set of real if possible. Example \(\0) PageIndex{1} \) Determine the values for which the rational expression is undefined: \(\0) dfrac{9y}{x}\) \ (\ dfrac{4b−3}{2b+5}\)\(\dfrac{x+4}{x^2+5x+6}\) Answer that the expression will be undefined when the denominator is zero. 1. \(\ dfrac {9y}{x}\) Set the denominator equal to zero. Resolve to variable. \(x=0\) \(\ dfrac is undefined for {9y}{x}\) (x=0\). 2. \(\ dfrac{4b−3}{2b+5}\) Set the denominator equal to zero. Resolve to variable. \(2b+5=0\)\(2b=−5\) \(b=−−−−dfrac{5}{2}\) \(dfrac{4b−3}{2b+5}\) is undefined for \0(2b=−5\) (b=−−>dfrac{5}{2}\). 3. \(\ dfrac {x+4}{x^2+5x+6}\) set the denominator equal to zero. Resolve to variable. \(x^2+5x+6=0\) \(x+2) (x+3) = 0\) \(x+2=0\) or \(x+3=0\) \(x=−0\) 2\) or \(x=−3\) \(dfrac{x+4}{x^2+5x+6}\) is undefined for \(x=−−2\) or \(x=−3\). Saying that rational expression \(\0) dfrac {x+4}{x^2+5x+6}\) is undefined for \(x=−2\) or \(x=−3\) zero in competition rules where the forbidden phrase is the same as writing. Example \(\0) PageIndex{2} \) Determine the values for which the rational expression is undefined: \(\0) dfrac {3y}{x}\) \(\ dfrac{8n−5}{3n+1}\) \(\ dfrac {a+10}{a^2+4a+3}\) Answer \(x=0\) \(n=−\\dfrac{1}{3}\) \(a=−1\), \(a example \−3\) example \(\pageindex{3}\) Determine the values for which the rational expression is undefined: \(\0\) dfrac {4p}{5q}\) \(\dfrac{y−1}{1 3y+2}\) \(\dfrac{m−5}{m=5}{m^2=2=2=0}\) Answer \(q=0\) \(y=−−\dfrac{2}{3}\) \(m=2, to evaluate a rational expression, We substitute and simplify the values of variables in expression, just as we have for many other expressions in this book. Example \(\PageIndex{4}\) for each value \(\)\.\)\.\) Evaluate dfrac {2x+3}{3x−5}\): Answer 1. Simple. 2. Simplify. 3. Simple. Example \(\pageindex{5}\) for each value (\pageindex).\\) Evaluate dfrac {y+1}{2y−3}\):Answer(−2)\(\0 dfrac{2}{9}\) \(\dfrac{1}{3}\) example \(\dfrac.\) PageIndex{6}\) Evaluation \(\dfrac for each value 1}{2x+1}\) Answer (\dfrac{4}{3}\) \(6\) \(−1 \) Evaluate example \(\pageindex{7}\) \(\dfrac{x^2+8x+7}{x^2−4}\) for each value: Answer 1. Simple. 2. Simplify. It is undefined for rational expression X = 2. 3. Simple. Example \(\0) PageIndex{8} \) evaluate for each{1}{2} value \(\dfrac{x^2+1}{x^2−3x+2}\) \dfrac{1}{3}\) \(2\) example \(\PageIndex{9}\) Evaluation \(\2\) dfrac {x^2+x−6}{x^2−9}\) for each value. Answer \(\dfrac{2}{3}\) \(\dfrac{4}{5 \) \(\) dfrac{1}{2}\) Remember that a fraction is simplified when its numerator and denominator have no common factor other than 1. When we evaluate a rational expression, we make sure to simplify the resulting fraction. Example \(\0) PageIndex{10} \) evaluate \(\dfrac{a^2+2ab+b^2}{3ab^2}\) for each value. \(a=1,\, b=2\)\(a=−2,\,b=−1\)\(a=\dfrac{1}{3}\), \(b=0\) Answer 1. (\ dfrac {a^2+2ab+b^2}{3ab^2}\) when \(a=1, \, b=2\) simple. 2. \(\ dfrac ^2}\) when \(a=−2,\,b=−1\) simple. 3. \(\ dfrac {a^2+2ab+b^2}{3ab^2}\) when \(a=\dfrac{1}{3}\\0 Example \(PageIndex{11}\) Evaluation Evaluation For each value. \(a=−1, \,b=2\)\(a=0,\,b=1\)\(a=1\), \(b=1\{1}{2}\) Answer \(−4\) \(0\) \(\dfrac{4}{9}\) example \(\pageindex{12} \) dfrac{a^2=b^2}8ab^3}\) for each value: \, b=−1\) (a=\dfrac{1}{2}\), \(b=−−1\)\(a=−2, \, b=1\) Answer \(0\) \(\0\) dfrac{3}{16}\\{3}{16} \ In addition to \(1\), in its numerator and denominator, a rational expression is simplified if there is no common factor other than \(1\) in its numerator and denominator. Definition: Simplified rational expression A rational expression is considered simple if there are no common factors in its numerator and denominator. For example: \(\dfrac{2}{3}\) has been simplified because there are no common factors of \(2\) and \(3\). \(\ dfrac {2x}{3x}\) is not simplified because \(x\) is a common factor of \(2x\) and \(3x\). We use equivalent fraction property to simplify numeric fractions. We explain it here again because we will also use it to simplify rational expressions. Definition: Equivalent fraction property if \(a\), \(b\), and \0 (c\) are numbers where \(b e 0\), \0 (ce 0\), then \0 [\ dfrac {a}{b}=\dfrac {a·c}{b· c}\ quad\text{ and }\quad\dfrac{a·c}{b·c}=\dfrac{a}{b}\] notice that in the equivalent fraction property, the values that will make denominators zero are specifically rejected. We see \(b e 0\), \(ce 0\) clearly stated. Every time we write a rational expression, we must make a statement rejecting similar values that would make a denominator zero. However, to focus on the task at hand, we will leave writing it in example. Let's start by reviewing how we simplify numerical fractions. Example \(\pageindex{13}\) Simple: \(−\dfrac{36}{63}\). Answer rewrite the numerator and denominator showing the common factors. Simplify using equivalent fraction property. Note that fraction \(−\dfrac{4}{7}\) has been simplified as there are no other common factors. ExAMPLe \(\PageIndex{14}\) Simple: \(−\dfrac{45}{81}\). Answer \(−dfrac{5}{9}\) Example \(\pageIndex{15}\) Simple: \(\\dfrac{42}{54}\). Answer (−\dfrac{7}{9}\) In this whole chapter, we will assume that all numeric values that will make the denominator zero are excluded. We won't write restrictions for each rational expression, but keep in mind that the denominator can never be zero. So in this next example, \(x e 0\) and \(y e 0\). Example \(\0) PageIndex{16} \) Simple: \(\dfrac{3xy}{18x^{2}y^{2}}\). Answer rewrite the numerator and denominator showing the common factors. Simplify using equivalent fraction property. Have you seen that when we divided monomials into polynomials, these are the steps that we took? Example \(\0) PageIndex{17} \) Simple: \(\dfrac{4x^{2}y}{12xy^2}\). Answer \(\0000 dfrac {x}{3y}\) example \(\0 PageIndex{18} \) Simple: \0 (\ dfrac {16x^{2}y}{2xy^2}\). Answer \(\0000 dfrac {8x}{y}\) To simplify rational expressions we first write arithmetic and denominator as positive. We remove common factors using equivalent fraction assets. Be very careful when removing common factors. Factors are multiplied to make the product. You can remove a factor from a product. You can't extract a word from an amount. Note that deleting x would be like canceling in fractions of \(\dfrac{x+5}{x}}\) 2\(\dfrac{2+5}{2}\)! How to simplify rational binomials example \(\pageindex{19} \) Simple: \(\\ dfrac {2x+8}{5x+20}\). Answer example \(\pageindex{20}\) Simple: \(\dfrac{3x−6}{2x−4}\). Answer \(\dfrac{3}{2}\) example \(\0 PageIndex{21} \) Simple: \(\\ dfrac {7y+35}{5y+25}\). Answer \(\dfrac{7}{5 \) We now summarize the steps you should follow to simplify rational expressions. Definition: Simplify a rational expression. Factor the arithmetic and denominator completely. Simplify by dividing common factors. Usually, we leave simplistic rational expression in positive form. This way it's easy to check that we've removed all common factors! We will use methods to include polynomial in factoring in digits and denominators in the following examples. Example \(\0) PageIndex{22} \) Simple: \(\dfrac{x^2+5x+6}{x^2+8x+12}\). Answer \(\0000 dfrac {x^2+5x+6}{x^2+8x+12}\) factor points and denominator. \(\ dfrac{ (x+2) (x+3)}{(x+2)(x+6)}\) remove common factors \(x+2\) from arithmetic and denominator. \(\ dfrac {x+3}{x+6}\) Can you tell which values of \(x\) should be excluded in this example? Example \(\PageIndex{23}\) Simple: \(\dfrac{x^2−x−2}{x^2−3x+2}\)). Answer \(\0000 dfrac {x+1}{x−1}\) example \(\pageindex{24}\) Simple: \(\0 dfrac {x^2−3x−10}{x^2+x−2}\). Answer \(\0000 dfrac {x−5}{x−1}\) example \(\pageindex{25}\) Simple: \(\0 dfrac {y^2+y−42}{y^2−36}\). Answer \(\0000 dfrac {y^2+y−42}{y^2−36}\). Points and denominator factors. \(\ dfrac { (y+7)(y−6)}{(y+6)}\) remove the common factor \(y−6\) from the marksheet and denominator. \(\ dfrac {y+7}{6}\) example \(\pageindex{26}\) Simple: \(\dfrac{x^2+x−6}{x^2−4}\). Answer \(\0000 dfrac {x+3}{x+2}\) example \(\pageindex{27}\) Simple: \(\0 dfrac {x^2+8x+7}{x^2−49}\). Answer \(\0000 dfrac {x+1}{x−7}\) example \(\PageIndex{28}\) Simple: \(\0 dfrac {p^3−2p^2+2p−4}p^2−7p+10}\). Answer \(\0000 dfrac{p^3−2p^2+2p−4}{p^2−7p+10}\) factor points and denominator, using group for arithmetic factor. \(\ dfrac{p^2 (p−2) + 2 (p−2) } {{(p−5) (p−2)}\) \ \(\ dfrac { (p^2+2) (p−2)}{(p−5)(p−2)}\) remove the common factor from the numerator and denominator. \(\ dfrac{p^2+2}{p−5}\) Example \(\PageIndex{29}\) Simple: \(\dfrac{y^3−3y^2+y−3}{y^2−y−6}\)). Answer \(\0000 dfrac {y^2+1}{y+2}\) example \(\0 PageIndex{30} \) Simple: \(\\ dfrac {p^3−p^2+2p−2}{p^2+4p−5}\). Answer \(\0000 dfrac{p^2+2}))) example \(\PageIndex{31}\) Simple: \(\dfrac{2n^2−14n}{4n^2−16n−48}\). Answer \(\0000 dfrac {2n^2−14n}{4n^2−16n−48}\) factor mark sheet and denominator, factoring the first GCF. \(n dfrac{2n(n−7)}{4(n^2−4n−12)}\) \(n dfrac{2n(n−7)}{4(n−6)(n+2)}\) Remove the common factor, \(2\). Example \(\0) PageIndex{32} \) Simple: \(\ dfrac {2n^2−10n}{4n^2−16n−20}\). Answer \(\0000 dfrac {n}{2(n+1)}\) example \(\PageIndex{33}\) Simple: \(\0 dfrac {4x^2−16x}{8x^2−16x−64}\). Answer \(\0000 dfrac {x}2 (x+2)}\) example \(\pageindex{34}\) Simple: \(\0 dfrac {3b^2−12b+12}{6b^2−24}\). Answer \(\0000 dfrac {3b^2−12b+12}{6b^2−24}\) factor points and denominator, factoring the first GCF. \(\ dfrac {3 (b^2−4b+4)(6(b^2−4)}\) remove the common factors of \(\dfrac{3(b−2)(b−2) (b+2)}\). \(\ dfrac {3 (b−2)}{2 (b+2)}\) example \(\0 PageIndex{35} \) Simple: \(\\ dfrac {2x^2−12x+18}{3x^2−27}\). Answer \(\0000 dfrac {2(x−3)}{3(x+3)}\) example(\pageindex{36}\) Simple: \(\dfrac{5y^2−30y+25}{2^2−50\).). Answer \(\0000 dfrac {5(x−1)}{2(x+5)}\) example \(\pageindex{37}\) Simple: \(\dfrac{m^3+8}{m^2−4}\). Answer \(\0000 dfrac{m^3+8}{m^2−4}\) using formulas for factor points and denominator, the amount of cubes and the difference of squares. \(\ dfrac { (m+2) (m^2−2m+4) }{{(m+2)(m−2)}\) remove the common factors of \(m+2\). \(\ dfrac{m^2−2m+4}{m−2}\) example \(\0 PageIndex{38} \) Simple: \(\dfrac{p^3−64}{p^2−16}\). Answer \(\0000 dfrac{p^2+4p+16}{p+4}\) example \(\PageIndex{39}\) Simple: \(\0 dfrac {x^3+8}{x^2−4}\). Answer \(\0000 dfrac {x^2−2x+4}{x−2}\) Now we will see how a rational expression can be simplified with the opposite factors of the digit and denominator. Let's start with a numerical fraction, say \0 (dfrac{7} {−7}\). We know that this fraction simplifies \(−1\). We also believe that points and denominator are the opposite. At the foundation, we introduced the opposite notation: unlike one is \(−a\). We also remember that \(a=−1·a\) we simplify the fraction\'s (\ dfrac {a}{−a} \ \[start{array}{ll} { }&\dfrac {a} {−a}\\\\}}}}&{\dfrac {13}{−1·a}\\\\{text{remove common factors.</a._000.</a0>. }} {{\ dfrac{1} {−1}}\\ {\ &{−1}\ So, that's how we can simplify this excerpt\. (\ dfrac{x−3}{−(x−3)}\)\[array}}}}{\dfrac{x−3}{3}\\\°{{{000{1·1·3}}{1·1·)}\\\\1·) x−3)}\\\\ {\text{remove common factors.\\\\{\'.<a0></a0><a0></a0></a0></a0></a0></a0></a0></a0></a0></a0></a0></a0></a0></00>.\\\\{{3 }} {{\ dfrac{1} {−1}}\\ {\ &{−1}\ Onbar \end {array}\]} but can be written differently as opposed to \(x−3\):\[\\ Start {array}{ll} {}&−−(x−3)}\0 &{−x+3}\\\\{\text{rewrite.}} &{3−x}\ Onbar \and {array}\] this means the fraction \\\n dfrac {x−3}{3−x}\) has been simplified. In general, we can type as (b−a\) as opposite to \(a−b\). So rational expression \(\0000000000000 dfrac simplifies {a−b}{b−a}\). Definition: The opposite in a rational expression is \(a−b\) \(b−a\) \(n dfrac{a−b}{b−a}=−1\), \(an e b\) for an expression and vice versa for partition \000 (−1\) We will use this property to simplify rational expressions that have opposites in their points and expressions. Example \(\0) PageIndex{40} \) Simple: \(\\ dfrac {x−8}{8−x}\). Answer \(\0000 dfrac {x−8}{8−x}\). Identify that \(x−8\) and \(8−x\) are the opposite −1 example \(\pageindex{41}\) simple: Answer \(−1\) Example \(\PageIndex{42}\) Simple: \(\) dfrac {n−9}

{9−n}\). Remember the answer \(−1\), the first step in simplifying rational expression is to make the digit and denominator a complete factor. Example \(\0) PageIndex{43} \) Simple: \(dfrac{14−2x}{x^2−49}\). Answer factor arithmetic and denominator. Identify \(7−x\) and \(x−7\) are the opposite. Simple. Example \(\0) PageIndex{44} \) Simple: \(dfrac{10−2y}{y^2−25}\). Answer \(−dfrac{2} {y+5}\) example \(\000000000000000000000000000000000000000000000000 PageIndex{45} \) Simple: \(\\ dfrac {3y−27}{81−y^2}\). Answer \(−dfrac{3} {9+y}\) example \(\pageindex{46}\) Simple: \(\0 dfrac {x^2−4x−32}{64−x^2}\). Answer factor arithmetic and denominator. Identify the opposite factors. Simple. Example \(\pageindex{47}\) Simple: \(\) dfrac {x^2−4x−5}{25−x^2}\)). Answer \(−\dfrac{x+1}{x+5}\) Example \(\pageindex{48}\) Simple: \(\0 dfrac {x^2+x−2}{1−x^2}\). Answer \(−\dfrac{x+2}{x+1}\) Determine the values for which the rational expression is undefined, set the denominator to zero. Solve the equation, if possible. Simplified rational expression A rational expression is considered simple if there are no common factors in its numerator and denominator. A rational expression factor points and denominator completely simple. Simplify by dividing common factors. The opposite in a rational expression is unlike \(a−b\) (b−a\). \(\ dfrac {a−b}{b−a}=−1\) \(a e b\), \(b e 0\), \(a e b\) b\)