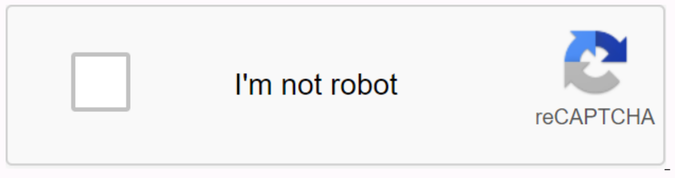
Algebraic fractions equations worksheet pdf



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Level 6-7 This is the easiest type that you will need to simplify, requiring only the need to cancel similar conditions. Example: Simplify the following \dfrac{55x^4y^3}{15x^2y} Using our knowledge of index rules we can cancel as follows. \dfrac{\sout{55}x^{\sout{4}} y^{\sout{3}}{\sout{15}\sout{x}^{\sout{2}}\sout{y}} = \dfrac{11x^2y^2}{3} When fractions include quadricolors, you must first consider the quadrant to simplify. Example: Simplify the faction \dfrac{a^2 + a - 6}{ab + 3b}. Step 1: First, we need to take into account the numeric and denominator of the faction. (Revise factoring quadratics here) Number first, a^2 + a - 6 = (a + 3)(a - 2) Now, for denominator, ab + 3b = b(a + 3) Step 2: Undo our faction, in this case we can cancel (a + 3) both in the numerator and in the denominator This looks like: \dfrac{(a+03)(a-2)}{b(a+3)}=\dfrac{\xcancel{(a + 3)}(a - 2)}{b \xcancel{(a + 3)}} = \dfrac{a - 2}{b} Multiplication and division of algebraic fractions is exactly the same as ordinary fractions. When multiplying, multiply the top with the top and bottom to the bottom separately. When splitting, simply turn the second fraction, and then multiply. Example: Simplify the following \dfrac{(3x+1)}{(x-1)} \div\dfrac{2x}{(x-1)} Step 1: Turn the second fraction upside down and change \div to \times \dfrac{(3x+1)}{(x -1)} \div \dfrac{2x}{(x-1)}==\dfrac{(3x+1)}{(x-1)} \times \dfrac{(x-1)}{2x} Step 2: Cancel the faction if possible. \dfrac{(3x+1)\xcancel{(x-1)}}{2x\xcancel{(x-1)}} = \dfrac{3x+1}{2x} When adding and subtracting fractions you must always find a common denominator, this is the same for algebraic fractions. Example: Write \dfrac{2}{x+2} + \dfrac{3}{2x+1} as a single fraction. Step 1: We need to multiply each fraction with the denominator of another faction. \bigg(\dfrac{2}{x+2}\times\textcolor{red}{\dfrac{2x+1}{2x+1}}\bigg) + \bigg (\dfrac{3}{2x+1}\times\textcolor{blue}{\dfrac{x+2}{x+2}\bigg) = \dfrac{2\textcolor{red}{(2x+1)}{{(x+2)\textcolor{red}{{(2x+1)}} + \dfrac{3\textcolor{blue}{(x+2)}}{{2x+1)\textcolor{blue}{(x+2)}} \dfrac{2\textcolor{red{{(2x+1)}{{{{(x+2)\textcolor{red {}{(2x+1)}} + \dfrac{3\textcolor{blue}{(x +2)}{{{(2x+1)\textcolor{blue}{(x+2)}} = \dfrac{4x + 2}{(x+ 2)(2x+1)} + \dfrac{13x+6}{(2x+1)(x+2)} Step 3: Add (or subtract) fractions \dfrac{4x + 2}{(x+2)(2x+1)} + \dfrac{3x+6}{{2x+1)) (x+2)} = \dfrac{7x+8}{(2x+1)(x+2)} Simplify completely the following algebraic fraction , \dfrac{2x + 4}{3xy} \times \dfrac{x}{x + 2} [4 tags] Step 1: Multiply top from top and bottom with bottom number of multipliers : (2x + 4) \times x = x(2x + 2x + 2x4) Multiply denominators: 3xy \times (x + 2) = 3xy(x + 2) So, our faction is: \dfrac{x(2x + 4)}{3xy(x + 2)} Step 2: Undo the x factor at the top and \dfrac{\xcancel{x}(2x + 4)}{3\xcancel{x}y(x + 2)} = \dfrac{2x + 4}{3y(x + 2)} Now, this might look like we have completely simplified it, but if we consider that 2x + 4 = 2(x + 2), then suddenly we have a common factor. We get: \dfrac{2(\xcancel{x + 2)}{3y\xcancel{(x + 2)}} = \dfrac{2}{3y} After cancellation (x + 2) no more common factors, so we are finished. Write \dfrac{m}{m - 6} + \dfrac{m}{7} as a single faction in the simplest form. [4 tags] Step 1: We need to multiply each fraction with the denominator of another faction. \dfrac{m}{\textcolor{red}{m - 6}}+\dfrac{m}{\textcolor{blue}{7}}= \dfrac{\textcolor{blue}{7}m}{\textcolor{blue}{7}(m - 6)}+\dfrac {1000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000 m(\textcolor{red}{m - 6}}{7(\textcolor{red}{m - 6})} Step 2: Add fractions \dfrac{7m + m(m - 6)}{{7(m - 6)} Step 3: Simplify where possible. \dfrac{7m + m(m- 6)}{7(m - 6)}=\dfrac{7m + m^2 - 6m}{7(m - 6)}=\dfrac{m^2 + m}{7(m - 6)}={m(m + 1)}{7(m - 6)} We cannot further simplify this faction, so the final answer is \dfrac{m(m + 1)}{7(m - 6)} We need to find a common denominator between all three fractions before we can make an add-on and subtract. Since the 30 is the lowest common multiple of 2, 3 and 5, we will select 30x as the common denominator. Therefore, we can multiply each term by, \dfrac{1}{2x}+\dfrac{1}{3x}-dfrac{1}{5x} = \bigg(\dfrac{1}{2x}\times\dfrac{15}{15}{1} <6>\bigg)+\bigg(\dfrac{1}{3x}\times\dfrac{10}{10}\bigg)-\bigg(\dfrac{1}{5x}\times\times\1 {6}{6} \bigg) \begin{aligned} &= \dfrac{15}{30x}+\dfrac{10}{30x}-\dfrac{6}{30x} \\\\&= \dfrac{15+10-6}{30x} \\\\&=\dfrac{19}{30x}\end{aligned} We need to find a common denominator between factions before we can make an add-on, therefore, \dfrac{8}{x}-\dfrac{1}{x-3}=\dfrac{8(x-3)}{x(x-3)}-dfrac{1(x)}{(x-3)(x)} This can be simplified to, \dfrac{8x-24-x}{x(x-3)}=\dfrac{7x-24}{x(x-3)} No longer common terms, so this is completely simplified. First, we'll look at the numeric allimeter before we factor it in. we need to expand the brackets, 2(8 - k) + 4(k - 1) = 16 - 2k + 4k - 4 = 2k + 12 Then, the most we can do is to extract 2 as a factor, leaving us with 2k + 12 = 2(k + 6) Now, the denominator is a special type of quadriplegic expression called the difference of two squares. , k^2 - 36 = (k + 6)(k - 6) As there is a factor (k + 6) in both the numeric book and the denominator, they will be canceled. \dfrac{2\cancel{(k + 6)}{{(\cancel{k + 6)}(k - 6)} = \dfrac{2}{k - 6} No more common factors, so we are done. Our first step in dividing any faction should be to turn the second faction and turn division into multiplication. \dfrac{7ab}{12} \div \dfrac{4a}{9b^2} = \dfrac{7ab}{12} \times \dfrac{9b^2}{4a} To complete multiplication, \dfrac{7ab}{12} \times \dfrac{9b^2}{4a}=\dfrac{3}{48a} There is a factor that we can cancel and can also remove factor 3 of 63 and 48, \times 21b^3}{3a \times 16} = \dfrac{21b^3}{16} To do this, we must find a common denominator. Therefore, the left part must be multiplied by (z + 5) at the top and bottom. \dfrac{z + 2}{z - 1} = \dfrac{(z + 2)(z + 5)}{(z - 1)(z + 5)} For the right fraction we will multiply (z - 1) at the top and bottom. \dfrac{z}{z + 5} = \dfrac{z(z- 1)}{(z - 1)(z + 5)} Then, the subtraction is: \dfrac{z + 2}{z - 1} - \dfrac{z}{z + 5} = \dfrac{(z + 2)(z + 1} 5)}{(z - 1)(z + 5)} - \dfrac{z(z- 1)}{(z - 1)(z + 5)} = \dfrac{(z + 2)(z + 5) - z(z- 1)}{(z - 1)(z + 5)} Number extension, we get: (z + 2)(z + 5) - z(z-1) = z^2 + 7z + 10 - z^2 + z = 8z + 10 Since the denominator (z - 1)(z + 5), we can see that there is no common factor which means that our final answer: \dfrac{2(4z + 5)}{(z - 1)(z + 5)} English (United Kingdom) English (United States) Español (Latinoamérica) Related topics: More math lessons A levels Math Worksheets Examples , solutions, videos, games, activities, and worksheets that are suitable for GCSE maths to help students learn how to solve equations that involve fractions. 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