Algebra 2 8.1

Simplify rational expressions

Simplify complex fractions

rational

simplify (a fraction)

GCF

Is it ever OK to divide by zero?

complex fraction

whiteboards

1. $\dfrac{(-2ab^2)^3}{20ab^4} \cdot \dfrac{-2a^2b^2}{5} \cdot 1.5\,(3x^2y)(2ax^3y^2)^2$

$\dfrac{-1\cdot-1\cdot a\cdot-1\cdot2\cdot abbb}{5}$

$\dfrac{-2\cdot a\cdot a\cdot b\cdot b\cdot b}{2\cdot2\cdot5\cdot a\cdot b\cdot b\cdot b\cdot a}$

$3\times x\times y\,2\,a\times x\times x\times y\times y\,2\,a\times x\times x\times y\times y$

$12a^2x^8y^5$

2. $\dfrac{4x^2-12x+9}{9-6x} = \dfrac{(2x-3)(2x-3)}{-3(-3+2x)}$

$(4x^2-6x)-6x+9$

$2x(2x-3)-3(2x-3)$

$= \dfrac{2x-3}{-3} = -\dfrac{(2x-3)}{3} = -\dfrac{2x+3}{3}$

Answer when undefined only if they ask (for now...)

GuidedPractice

Simplify each expression.

3A. $\dfrac{(xz - 4z)}{z^2(4 - x)}$

$$\frac{z(x-4)}{z^2(-1)(x-4)}$$

$$\frac{1}{-z} = -\frac{1}{z} = -\frac{1}{z}$$

4C. $\frac{16mt^2}{21a^4b^3} \div \frac{24m^3}{7a^2b^2}$

4D. $\frac{12x^4y^2}{40a^4b^4} \div \frac{6x^2y^4}{16a^2x}$

$$\frac{16mtt}{21aaabbb} \cdot \frac{7aabb}{24mmm}$$

$$\frac{2t^2}{9a^2bm^2}$$

-16
-8 2
-8

Example 3 Polynomials in the Numerator and Denominator

Simplify each expression.

a. $\dfrac{x^2-6x-16}{x^2-16x+64} \cdot \dfrac{x-8}{x^2+5x+6} =$

64
-8 -8
-16

6
2 3
5

$$\frac{(x-8)(x+2)(x-8)}{(x-8)(x-8)(x+2)(x+3)}$$

$$\frac{1}{x+3}$$

b. $\frac{x^2-16}{12y+36} \div \frac{x^2-12x+32}{y^2-3y-18}$

-18, -6, 3, -3

$\frac{x^2-16}{12y+36} \cdot \frac{y^2-3y-18}{x^2-12x+32}$

32, -8, -4, -12

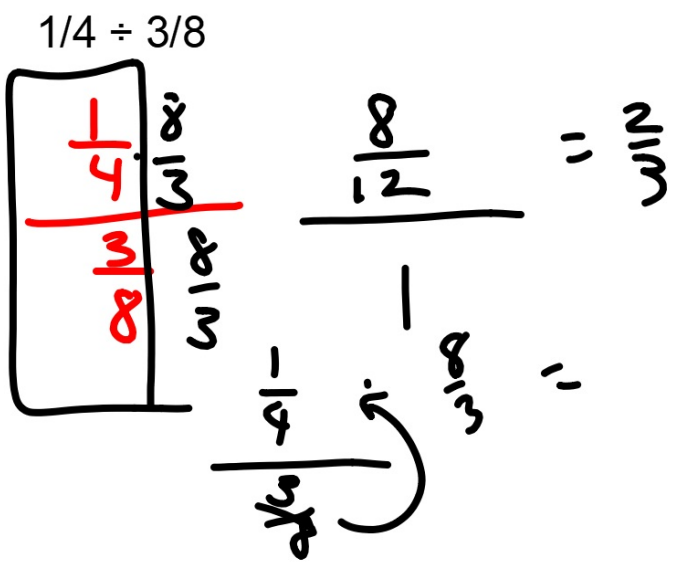
$\frac{(x-4)(x+4)}{12(y+3)} \cdot \frac{(y-6)(y+3)}{(x-8)(x-4)}$

GuidedPractice

5A. $\dfrac{8x-20}{x^2+2x-35} \cdot \dfrac{x^2-7x+10}{4x^2-16}$

5B. $\dfrac{x^2-9x+20}{x^2+10x+21} \div \dfrac{x^2-x-12}{6x+42}$

1/4 ÷ 3/8



Isn't this just code for division?
"Complex fraction"

Multiply by recip (why does that work?)

Example 6 Simplify Complex Fractions

Simplify each expression.

a. $\dfrac{\left(\frac{a+b}{4}\right)}{\left(\frac{a^2+b^2}{4}\right)}$

$\dfrac{(a+b)}{4} \div \dfrac{(a^2+b^2)}{4}$

$\dfrac{a+b}{4} \cdot \dfrac{4}{a^2+b^2} = \dfrac{a+b}{a^2+b^2}$

$= \dfrac{ab}{a^2+b^2}$

$\dfrac{\frac{ab}{a^2b^2}}{\frac{1}{ab}}$

a^2-b^2

b. $\dfrac{\left(\dfrac{x^2}{x^2-y^2}\right)}{\left(\dfrac{4x}{y-x}\right)} = \dfrac{x^2}{x^2-y^2} \cdot \dfrac{(y-x)}{4x}$

$= \dfrac{x \cdot x \cdot (y-x)}{(x+y)(x-y)4x}$ $\quad \dfrac{-1(-y+x)}{4(x+y)} = \dfrac{-1x}{4(x+y)} = \dfrac{-1}{4} \cdot \dfrac{x}{x+y}$

$\dfrac{x}{-4(x+y)}$

GuidedPractice

Simplify each expression.

6A. $\dfrac{\dfrac{(x-2)^2}{2(x^2-5x+4)}}{\dfrac{x^2-4}{4x-10}}$

6B. $\dfrac{\dfrac{x^2 - y^2}{y^2 - 49}}{\dfrac{y - x}{y + 7}}$ $\dfrac{y+7}{y-x}$

8.1 WB pr. Odd +22