Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra 2/Honors Algebra 2

April 24, 2020

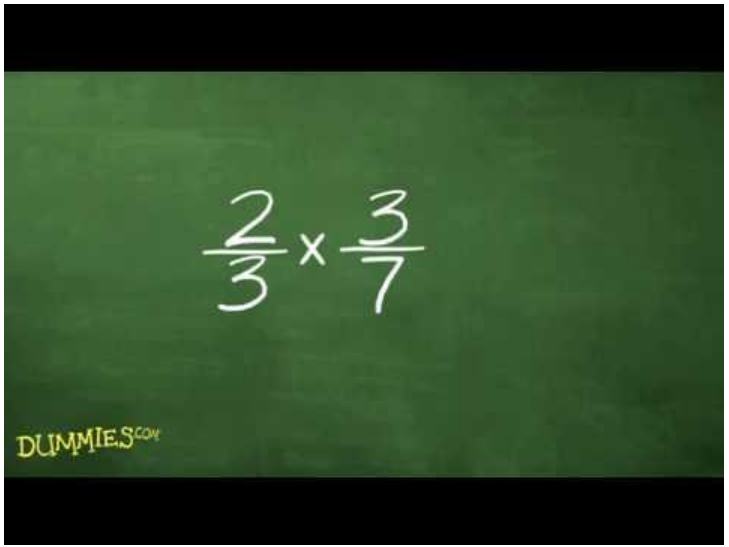
Lesson: April 24, 2020

Objective/Learning Target:
Students will divide rational expressions.

Let's Get Started:
First, think about what you remember about dividing fractions?

$$\frac{3}{5} \div \frac{2}{3}$$

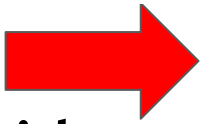
Watch Video:
Second, watch this video and feel free to take notes if you need to.



Topic of the Day:

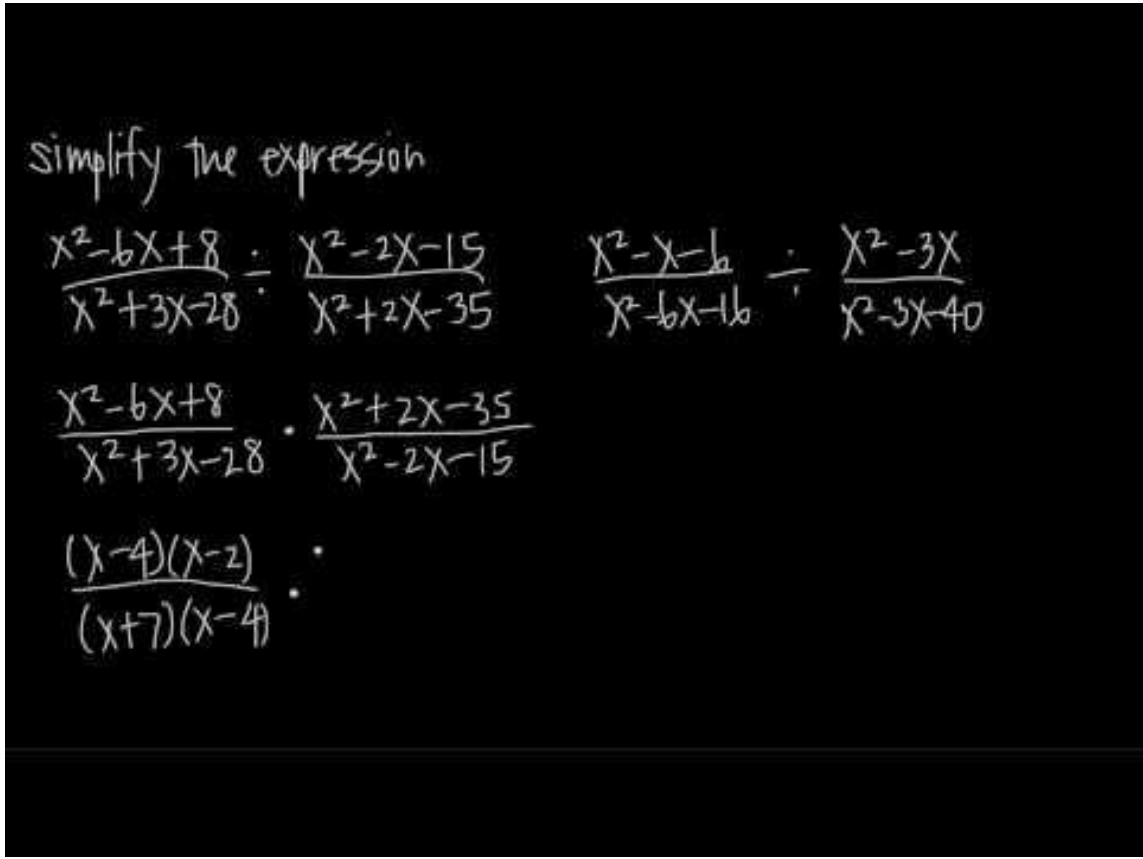
Today you will learn how to divide rational expressions that look like

$$\frac{x^2-6x+8}{x^2+3x-28} \div \frac{x^2-2x-15}{x^2+2x-35}$$



Watch the next video:

Watch this video
and take notes over the two examples.



Steps for Dividing Rational Expressions:
(write this down!)

- **Factor everything**
- **Identify the domain** (this is the restricted values for x)
- **Flip the 2nd fraction and change the symbol to multiplication**
- **Re check the domain** (you may now have new restricted values for x)
- **Cancel** (only if the factor is the same on the top and bottom)
- **Write out the simplified answer** (what is left after canceling)

Let's look at example #1:

(write this down!)

Problem: $\dfrac{2x^2 - x - 15}{x^2 - 2x - 3} \div \dfrac{2x^2 + 3x - 5}{1 - x^2}$

Step 1: Factor

$$\frac{(2x+5)(x-3)}{(x-3)(x+1)} \div \frac{(2x+5)(x-1)}{(1-x)(1+x)}$$

Step 2: Find the domain by setting the factors in the denominator equal to zero

Domain:

$x \neq 3$

$x \neq -1$

$x \neq -\frac{5}{2}$

$x \neq 1$

Step 3: Flip the 2nd fraction and change the symbol to multiplication

$$\frac{(2x+5)(x-3)}{(x-3)(x+1)} \cdot \frac{(1-x)(1+x)}{(2x+5)(x-1)}$$

Step 4: Re-check the domain

Step 5: Cancel

$$\frac{\cancel{(2x+5)}\cancel{(x-3)}}{\cancel{(x-3)}(x+1)} \cdot \frac{(1-x)\cancel{(1+x)}}{\cancel{(2x+5)}(x-1)}$$

Step 6: Write out the simplified answers

$$\frac{1-x}{x-1}$$

Let's look at example #2:

(write this down!)

Problem: $\dfrac{x^2-16}{x^2-2x-8} \div \dfrac{6x+24}{7x^2+14x}$

Step 1: Factor

$$\frac{(x-4)(x+4)}{(x-4)(x+2)} \div \frac{6(x+4)}{7x(x+2)}$$

Step 2: Find the domain by setting the factors in the denominator equal to zero

Domain:

$x \neq 4$

$x \neq -2$

$x = -4$

Step 3: Flip the 2nd fraction and change the symbol to multiplication

$$\frac{(x-4)(x+4)}{(x-4)(x+2)} \cdot \frac{7x(x+2)}{6(x+4)}$$

Step 4: Re-check the domain

Step 5: Cancel

$$\frac{\cancel{(x-4)}(x+4)}{\cancel{(x-4)}(x+2)} \cdot \frac{7x\cancel{(x+2)}}{6\cancel{(x+4)}}$$

Step 6: Write out the simplified answers

$$\frac{7x}{6}$$

Divide Rational Expressions Practice:

On the same sheet of paper, divide/simplify the following practice problems.

17) $\dfrac{b^2 - 2b - 15}{8b + 20} \div \dfrac{2}{4b + 10}$

18) $\dfrac{10b^2 + 42b + 36}{6b^2 - 2b - 60} \div \dfrac{40b + 48}{3b^2 - 13b + 10}$

19) $\dfrac{16x - 56}{8} \div \dfrac{8x - 28}{4}$

20) $\dfrac{10x^2 - 28x + 16}{2x - 4} \div \dfrac{25x^2 - 25x + 4}{5x^2 - 41x + 8}$

21) $\dfrac{6p + 27}{18p^2 + 36p} \div \dfrac{16p + 72}{2p + 4}$

22) $\dfrac{3x^2 - 25x - 18}{27x + 18} \div \dfrac{5x - 3}{5x^2 - 33x + 18}$

Dividing Rational Expressions Answer Key:

Once you have completed the problems, check your answer here.

17) $\frac{b^2-2b-15}{8b+20} \div \frac{2}{4b+10}$

$\frac{(b+3)(b-5)}{4}$ Domain : $b \neq -\frac{5}{2}$

18) $\frac{10b^2+42b+36}{6b^2-2b-60} \div \frac{40b+48}{3b^2-13b+10}$

$\frac{b-1}{8}$ Domain : $b \neq -3, -\frac{6}{5}, 1, \frac{10}{3}$

19) $\frac{16x-56}{8} \div \frac{8x-28}{4}$

1 Domain : $x \neq \frac{7}{2}$

20) $\frac{10x^2-28x+16}{2x-4} \div \frac{25x^2-25x+4}{5x^2-41x+8}$

$x-8$ Domain : $x \neq \frac{1}{5}, \frac{4}{5}, 2, 8$

21) $\frac{6p+27}{18p^2+36p} \div \frac{16p+72}{2p+4}$

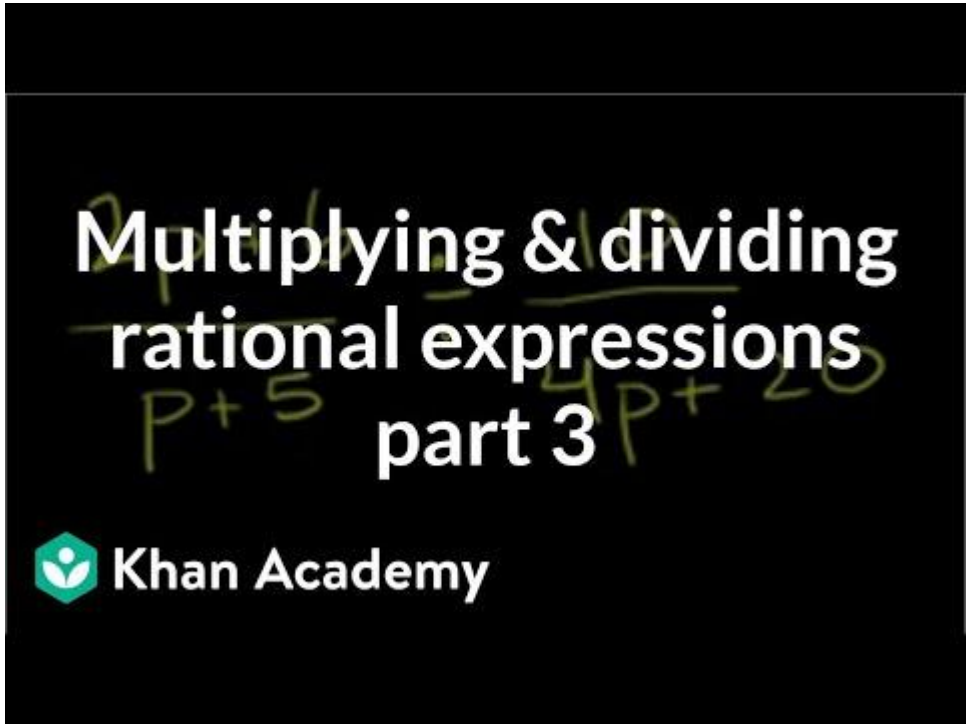
$\frac{1}{24p}$ Domain : $p \neq -\frac{9}{2}, -2, 0$

22) $\frac{3x^2-25x-18}{27x+18} \div \frac{5x-3}{5x^2-33x+18}$

$\frac{(x-9)(x-6)}{9}$ Domain : $x \neq -\frac{2}{3}, \frac{3}{5}, 6$

Additional Practice:

Click on the links below to get additional practice and to check your understanding!



Dividing Rational Expressions Practice - worksheet and answers