

HAPPY NEW YEAR!

HAT  
Operations with Rational Expressions

1/4/18 and 1/5/18

Warm Up:

Given  $f(x) = \frac{2x^3 + 5x^2 - 23x + 10}{2x^3 + 3x^2 - 32x + 15}$  find  $f(2)$

$$f(0)$$

$$f(-3)$$

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

$$f(-5) = \frac{0}{0} \text{ undefined}$$

Simplify  $f(x)$  and find  $f(2)$  → undefined at  $x = -5, \frac{1}{2}, 3$

$$f(x) = \frac{x-2}{x-3} \quad f(2) = \frac{2-2}{2-3} = \frac{0}{-1} = 0$$

$$f(-5) = \frac{7}{8}$$

Find  $f(3)$  undefined

Ex#1: Simplify completely.

a)  $\frac{15}{40} \cdot \frac{12}{18} = \frac{3 \cdot 5}{5 \cdot 2 \cdot 4} \cdot \frac{3 \cdot 4}{3 \cdot 3 \cdot 2} = \frac{1}{4}$

$\frac{\cancel{3}}{4\cancel{0}} \cdot \frac{\cancel{4}}{\cancel{3}} = \frac{1}{4}$

b)  $\frac{x^2 + 3x - 10}{x^2 + 8x + 15} \cdot \frac{x^2 + 5x + 6}{x^2 + 4x + 4}$

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

$\therefore \frac{x-2}{x+2}$  undefined when  $x = -2, -5, -3$

Ex#2: Simplify completely.

$$\frac{a^3 - b^3}{a + b} \cdot \frac{a^2 - b^2}{a^2 + ab + b^2}$$

$$a^2 + ab + b^2 = 0 \\ a \neq b = 0$$

$$\frac{(a-b)\cancel{(a^2 + ab + b^2)}}{\cancel{a+b}} \cdot \frac{\cancel{(a+b)}(a-b)}{\cancel{a^2 + ab + b^2}}$$

$$a+b=0 \\ a=-b$$

$(a-b)^2$  undefined when  
 $a=-b$ , or  $a=b=0$

Ex#3: Simplify completely.

Under what conditions is this expression undefined?

$$\frac{21-3x}{x^2-49} \div \frac{3x}{x^2+7x}$$

$$\frac{-x+7}{-1(x-7)} \cdot \frac{2(\bar{7}-x)}{(x+7)(x-7)} \cdot \frac{x(x+7)}{3x}$$

- | undefined when  
 $x = 7, -7, 0$

Ex#4: Simplify completely.

Under what conditions is this expression undefined?

$$\frac{\left(\frac{10}{x^2 + 2x}\right)}{\left(\frac{15}{x^2 + 3x + 2}\right)} \quad \frac{\cancel{10}^2}{x(\cancel{x+2})} \cdot \frac{(x+1)\cancel{(x+2)}}{\cancel{15}_3}$$

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

undefined when  $x = 0, -2, -1$

END MULTIPLY/DIVIDE/REDUCE

Assignment: (NC) page 533 #31-36, 42-45, 51, 53, 61

HAT  
More Operations with Rational Expressions

1/5/18



First QUIZ (8.1, 8.2, 8.5, 8.6) of the New  
Year  
Thursday, 1/11/18

Already?!?!?

Warm Up: Simplify completely.

Under what conditions is this expression undefined?

a) 
$$\frac{x^2 + 11x + 18}{x^2 - x - 6} \cdot \frac{x^2 + 2x - 15}{3x^2 + 27x} \div \frac{x^2 - 25}{x}$$

b) 
$$\frac{\frac{x^2 + 2x - 3}{x - 3}}{4x + 12}$$

c) 
$$\frac{5}{12} + \frac{3}{8}$$

d) 
$$\frac{4}{8} + \frac{6}{12}$$

Ex#1: Simplify completely.

Under what conditions is this expression undefined?

$$\frac{3}{x^2 + 2x - 8} + \frac{x}{x^2 - 16}$$

Ex#2: Simplify completely.

Under what conditions is this expression undefined?

$$\frac{6}{2x-8} - \frac{x+1}{x^2-x-12}$$

Ex#3: Simplify completely.

Under what conditions is this expression undefined?

$$\frac{x+3}{2x-10} + \frac{1}{x^2-2x-15}$$

Ex#4: Simplify completely.

$$\frac{\frac{a}{b} - 1}{1 - \frac{b}{a}}$$

END ADD/SUBTRACT

Assignment: page 541 #29, 33, 37, 47, 49, 51, 54, 55, 63

January 4, 2018

