

November 28, 2016

* Exam # 3 - Friday

- Chp 5 - Polynomial Multiplication
- Chp 6 - Factoring including Sum/Diff. of Cubes
- Chp 7 - Rational Functions

Nov 28-9:05 AM

Chapter 7

7.3 Simplifying Rational Expressions

Rational Functions

$$f(x) = \frac{p(x)}{q(x)}$$

where $p(x)$ & $q(x)$ are Polynomials.

* $q(x) \neq 0!$

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Rational Expressions

$$\frac{x+2}{3x}, \frac{x+3}{x^2-2x-4}, \frac{2x}{3y^2}$$

test:

$$\frac{3x}{3} = \frac{0}{3}$$

$$x = 0$$

* so, $x \neq 0$

Domain: $\{x \mid x \in \mathbb{R} \text{ \& } x \neq 0\}$

$$(-\infty, 0) \cup (0, \infty)$$

↑ union

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Domain of a Function:
is the set of all valid "inputs"

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$$\frac{2x}{x+3} = 0$$

$$x = -3$$

* so, $x \neq -3$

D: $(-\infty, -3) \cup (-3, \infty)$

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Simplifying Rational Expressions

- multiplication

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$$

$$\frac{\cancel{2}^1}{\cancel{x}^1} \cdot \frac{x^2}{4x} = \frac{1}{1} \cdot \frac{x}{2}$$

$$= \frac{x}{2}$$

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$$\frac{2x^5}{24x^3} = \frac{\cancel{2} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x}}{\cancel{2} \cdot 2 \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x}}$$

$$= 1 \cdot 1 \cdot 1 \cdot 1 \cdot \frac{1}{2} \cdot \frac{x}{1} \cdot \frac{x}{1}$$

$$= \frac{x^2}{2}$$

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• Addition/Subtraction w/ Like Denominators

$$\frac{a}{b} \pm \frac{c}{b} = \frac{a \pm c}{b}$$

$$\frac{5}{9c} - \frac{17}{9c} = \frac{5-17}{9c}$$

$$= \frac{-12}{9c} \text{ not A.P.}$$

$$= -\frac{\cancel{12}^4}{\cancel{9}^3c}$$

$$= -\frac{4}{3c}$$

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• Division

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$$

$$= \frac{ad}{bc}$$

$$\frac{x^2}{y} \div \frac{x^4}{2y^2}$$

$$\frac{\cancel{1}x^{\cancel{2}}}{\cancel{1}y} \cdot \frac{2y^{\cancel{2}}}{x^{\cancel{4}2}} = \frac{2y}{x^2}$$

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$$\frac{b^5}{c^{4^2}} \cdot \frac{\cancel{c}^2}{8\cancel{b}^2} = \frac{b^3}{8c^2}$$

$\frac{b^5 c^2}{c^4 8b^2}$ ← not A.P.

$$= \frac{b^3}{8c^2}$$

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• Addition/Subtraction w/ Unlike Denominators

$$\frac{a}{b} \pm \frac{c}{d} = \frac{ad \pm bc}{\underbrace{bd}_{LCD}}$$

$$\frac{19}{36x^3} + \frac{5}{48y^3}$$

LCD: ?

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Start 7.3

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