

Week 10: Algebra 2

Unit 7: Lesson 1: Rational Expressions

Objectives

- Students will understand that a rational can be represented as a rational expression
- Students will be able to convert between radicals and rational expressions

Materials: Dry-Erase and permanent markers, index tables, calculator, graphing calculator, handouts, paper, pencil, MP 1

Time	Activity
10 min	Exit Ticket Simplify the following rational expressions using their rules above:
30 min	Direct Instruction Rational expressions involving radicals and rational expressions. Show with the class several simplifying expressions, so that they can see the method with some different numbers. Make it a point that there will be errors. Steps $\frac{12x^2 + 20x + 8}{x^2 + 4x + 4} = \frac{4(3x^2 + 5x + 2)}{(x+2)^2}$$\frac{4(3x^2 + 5x + 2)}{(x+2)^2} = \frac{4(3x^2 + 6x + 2x + 2)}{(x+2)^2}$$\frac{4(3x^2 + 6x + 2x + 2)}{(x+2)^2} = \frac{4(3x(x+2) + 2(x+2))}{(x+2)^2}$$\frac{4(3x(x+2) + 2(x+2))}{(x+2)^2} = \frac{4(3x + 2)(x+2)}{(x+2)^2}$$\frac{4(3x + 2)(x+2)}{(x+2)^2} = \frac{4(3x + 2)}{x+2}$ Answers By the definition of a rational root Factor the radical as polynomial expression When multiplying, add exponents Simplify to the 1st power is there If the powers are equal the expression must be there Factor out 4. When $\sqrt{8} = 2\sqrt{2}$ Then generalize the expression with any letter as the number. Show that $\sqrt{4a^2} = 2a$ Examples 1. $\sqrt{128} = \sqrt{64 \cdot 2} = 8\sqrt{2}$ 2. $\sqrt{500} = \sqrt{100 \cdot 5} = 10\sqrt{5}$ 3. $\sqrt{72} = \sqrt{36 \cdot 2} = 6\sqrt{2}$ 4. $\sqrt{48} = \sqrt{16 \cdot 3} = 4\sqrt{3}$ What other rules simplify fractions? 1. $\frac{1}{\frac{1}{a}} = a$ 2. $\frac{a}{\frac{1}{b}} = ab$ 3. $\frac{\frac{1}{a}}{b} = \frac{1}{ab}$ 4. $\frac{a}{\frac{1}{b}} = ab$ 5. $\frac{\frac{1}{a}}{\frac{1}{b}} = \frac{b}{a}$ What other simplifications? 1. $\frac{a}{a} = 1$ 2. $\frac{a}{a^2} = \frac{1}{a}$ 3. $\frac{a^2}{a} = a$ 4. $\frac{a^3}{a^2} = a$ 5. $\frac{a^4}{a^3} = a$ 6. $\frac{a^5}{a^4} = a$ 7. $\frac{a^6}{a^5} = a$ 8. $\frac{a^7}{a^6} = a$ 9. $\frac{a^8}{a^7} = a$ 10. $\frac{a^9}{a^8} = a$ 11. $\frac{a^{10}}{a^9} = a$ 12. $\frac{a^{11}}{a^{10}} = a$ 13. $\frac{a^{12}}{a^{11}} = a$ 14. $\frac{a^{13}}{a^{12}} = a$ 15. $\frac{a^{14}}{a^{13}} = a$ 16. $\frac{a^{15}}{a^{14}} = a$ 17. $\frac{a^{16}}{a^{15}} = a$ 18. $\frac{a^{17}}{a^{16}} = a$ 19. 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Homework 9 1 Rational Exponents

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