Algebra 2 Workbook

Rational functions

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LONG DIVISION OF POLYNOMIALS

■ 1. Find the quotient.

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

■ 2. Find the quotient.

$$\frac{2x^3 - x^2 - 4x + 5}{x - 2}$$

■ 3. Find the quotient.

$$\frac{2x^4 + 4x^3 - x^2 + 5x - 150}{x + 4}$$

■ 4. Find the quotient.

$$\frac{3x^3 - x^2 - 7x + 5}{x - 1}$$

■ 5. Find the quotient.

$$\frac{-x^2+3x+15}{x+5}$$

■ 6. Find the quotient.

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

■ 7. Find the quotient.

$$\frac{x^3+6}{x+6}$$

■ 8. Find the quotient.

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

■ 9. Find the quotient.

$$\frac{x^4-2x^2}{x-4}$$

■ 10. Find the quotient.

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

SIMPLIFYING RATIONAL FUNCTIONS

■ 1. Reduce the fraction to its lowest terms.

$$\frac{4x^3 + 12x^2 + 8x}{12x^2}$$

■ 2. Reduce the fraction to its lowest terms.

$$\frac{10x^2 - 5x + 20}{15x^2}$$

■ 3. Reduce the fraction to its lowest terms.

$$\frac{3x^4 + 6x^3 - 18x^2}{12x^3}$$

■ 4. Reduce the fraction to its lowest terms.

$$\frac{18y^2 + 6y}{8y}$$

■ 5. Simplify each expression in the difference.

$$\frac{3ab + 2a^2b^2}{5ab} - \frac{12a^3b^3 + 3a^2b^2}{6a^2b^2}$$

■ 6. Simplify each expression in the sum.

$$\frac{2ab^2 + 3a^2b^3}{a^3b^3} + \frac{2ab^3 + b^4}{ab^3}$$

■ 7. Simplify each expression in the sum.

$$\frac{8mn + 20m}{4mn} + \frac{m^3n - 3m^2n}{6m^2n}$$

■ 8. Simplify each expression in the difference.

$$\frac{21x^2y^2}{14x^3y} - \frac{24xy + 12y}{96y}$$

ADDING AND SUBTRACTING RATIONAL FUNCTIONS

■ 1. Simplify the expression.

$$\frac{2}{3ab}+\frac{b}{4a}+\frac{ab}{6}$$

■ 2. Simplify the expression.

$$\frac{1}{2xy}+\frac{2}{3x^2}+\frac{3}{4xy^2}$$

■ 3. Simplify the expression.

$$\frac{a}{3xy}+\frac{b}{15y^2}+\frac{c}{5x^3y^2}$$

■ 4. Simplify the expression.

$$\frac{x}{2x^2y}+\frac{y}{3z}+\frac{z}{5yz^2}$$

■ 5. Simplify the expression.

$$\frac{3ab}{4c}+\frac{2bc}{6a^3}+\frac{5}{8ab^2c^3}$$

MULTIPLYING RATIONAL FUNCTIONS

■ 1. Simplify the expression.

$$\frac{25x^2-4}{x^2-36}\cdot\frac{x+6}{5x-2}$$

■ 2. Simplify the expression.

$$\frac{4x^2-49}{9x^2-16}\cdot\frac{3x+4}{2x+7}$$

■ 3. Simplify the expression.

$$\frac{x^2-25}{81x^2-64}\cdot\frac{9x-8}{x-5}$$

■ 4. Simplify the expression.

$$\frac{x^2+8x+16}{9x^2+36x+36}\cdot\frac{3x+6}{x+4}$$

■ 5. Simplify the expression.

$$\frac{16x^2+16x+4}{x^2+18x+81}\cdot\frac{x^2-81}{16x^2-4}$$

6. Simplify the expression.

$$\frac{x^2+5x-14}{x^2+2x-3}\cdot\frac{x^2+4x-5}{x^2+9x+14}$$

7. Simplify the expression.

$$\frac{x^2+3x+2}{x^2-7x+12}\cdot\frac{x^2+2x-15}{x^2-4x-12}$$

8. Simplify the expression.

$$\frac{x^2+x-56}{x^2-x-90}\cdot\frac{x^2+8x-9}{x^2-5x-14}$$

9. Simplify the expression.

$$\frac{2x^2-13x-24}{3x^2-x-4}\cdot\frac{3x^2-7x+4}{x^2-6x-16}$$

DIVIDING RATIONAL FUNCTIONS

■ 1. Simplify the expression.

$$\frac{2x+16}{9x^2+27x} \div \frac{3x+24}{x+3}$$

■ 2. Simplify the expression.

$$\frac{6x+15}{12x^2+24x} \div \frac{2x+5}{5x+10}$$

■ 3. Simplify the expression.

$$\frac{3x^3-3x^2-6x}{2x^2-14x+24} \div \frac{3x^2+21x}{x^2-8x+15}$$

■ 4. Simplify the expression.

$$\frac{2x^2-13x-7}{12x+6} \div \frac{3x-2}{3x^2-17x+10}$$

■ 5. Simplify the expression.

$$\frac{4x^2+13x+10}{3x+6} \div \frac{3x-1}{3x^2-13x+4}$$

6. Simplify the expression.

$$\frac{x^2-9}{x^2+x-2} \div \frac{x^2+4x+3}{x^2-16}$$

7. Simplify the expression.

$$\frac{4x^2-9}{x^2+12x+36} \div \frac{4x^2-12x+9}{x^2+7x+6}$$

8. Simplify the expression.

$$\frac{15x^2+75x+90}{5x^2+50x+125} \div \frac{x^2-3x+2}{x^2-25}$$