

Name _____

Rational Expression Worksheet #1: Simplifying

Simplify.

1. $\frac{18x^6}{27x^4}$

2. $\frac{3x^2}{12x}$

3. $\frac{10a^3b}{-15ab^3}$

4. $\frac{36k^3m}{24k^4mn^5}$

5. $\frac{12x^2}{9x^2y}$

6. $\frac{42x^2}{-36x^3}$

7. $\frac{16a^2b^3c^4}{20a^7b^2c^2}$

8. $\frac{120x^3y}{25xy^5}$

9. $\frac{-16x^2y^7}{12x^5y^3z^4}$

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Rational Expression Worksheet #2: Simplifying

Simplify (*remember to factor when necessary*).

1. $\frac{2x+6}{4x-12}$

2. $\frac{x^2+9x+20}{2x+8}$

3. $\frac{6x+24}{x^2+7x+12}$

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

5. $\frac{3x-12}{3x^2-12x}$

6. $\frac{x^2-5x+6}{x^2+2x-15}$

7. $\frac{4x+4}{x^2+4x+3}$

8. $\frac{x^2-x-12}{x^2-2x-8}$

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

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Rational Expression Worksheet #3: Simplifying

Simplify. Remember to factor if necessary

1. $\frac{28x^3}{35x^5}$

2. $\frac{5x+40}{4x+32}$

3. $\frac{36y^2}{12y}$

4. $\frac{x^2+12x+20}{3x+6}$

5. $\frac{6x+30}{x^2+8x+15}$

6. $\frac{25a^3b^7}{-15a^8b^3}$

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

8. $\frac{38k^2m^2n}{24k^4mn^5}$

9. $\frac{7x-14}{x^2-2x}$

10. $\frac{-16x^2y^5z}{8x^3y^2z^2}$

11. $\frac{x^2-6x+8}{x^2+2x-24}$

12. $\frac{9x+9}{x^2+8x+7}$

13. $\frac{x^2+3x-28}{x^2-2x-8}$

14. $\frac{x^2-7x+6}{x^2-6x}$

15. $\frac{36a^5b^2c^6}{42a^7b^2c^2}$

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Rational Expression Worksheet #4: Multiplying

Multiply the expressions (*remember to factor when necessary*).

1. $\frac{12x^3}{25} \cdot \frac{40}{9x^2}$

2. $\frac{6}{x^2 - 9x + 20} \cdot \frac{5x - 25}{15}$

3. $\frac{6x - 18}{4x^2} \cdot \frac{x^3}{2x - 6}$

4. $\frac{x + 3}{4} \cdot \frac{x + 2}{x^2 + 4x + 3}$

5. $\frac{5}{x + 1} \cdot \frac{x^2 - 6x - 7}{3x - 21}$

6. $\frac{9x + 18}{x^2 - 2x - 8} \cdot \frac{3x - 12}{6x}$

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Rational Expression Worksheet #5: Multiplying & Dividing

Multiply or divide these rational expressions. Show work and **FACTOR!!**

1. $\frac{2a^2b}{b^2c} \cdot \frac{b}{a}$

2. $\frac{y^2 - 2y - 15}{4} \cdot \frac{8}{y + 3}$

3. $\frac{x - 5}{6} \div \frac{2x - 10}{12}$

4. $\frac{5n + 15}{4n + 8} \cdot \frac{2n + 4}{3n + 9}$

5. $\frac{x^2 - 2x}{6} \div \frac{3x - 6}{x}$

6. $\frac{m^2 - 2m - 8}{8m + 24} \div \frac{2m - 8}{m^2 + 7m + 12}$

7. $\frac{x + 3}{10x + 20} \cdot \frac{x + 2}{x^2 + 4x + 3}$

8. $\frac{x^2 - x - 12}{x - 4} \div \frac{2x + 6}{x - 5}$

9. $\frac{x^2 - 5x - 6}{5x + 15} \div \frac{x^2 - 3x - 4}{7x + 21}$

10. $\frac{24x^3}{25y^5} \cdot \frac{15y^2}{8x^2}$

11. $\frac{6x - 18}{4x} \cdot \frac{x}{2x - 6}$

12. $\frac{3x + 12}{12x} \div \frac{x + 4}{48x^3}$

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Rational Expression Worksheet #6: Multiplying & Dividing

Multiply or divide the rational expressions. Show work & factor when necessary.

1. $\frac{2x+6}{5x+10} \cdot \frac{x+2}{x^2+4x+3}$

2. $\frac{x^2-x-12}{3x-9} \div \frac{x-4}{12}$

3. $\frac{x^2-5x+4}{x^2} \div \frac{x-1}{x}$

4. $\frac{6}{x^2+9x+20} \cdot \frac{8x+40}{6x-12}$

5. $\frac{5x-15}{4x^2} \cdot \frac{x^3}{6x-18}$

6. $\frac{7x^2}{12x} \div \frac{14x^3}{48y^3}$

7. $\frac{x^2+5x-24}{2x+2} \div \frac{3x+24}{x^2-8x-9}$

8. $\frac{24x^3}{50x} \cdot \frac{30}{8x^2}$

9. $\frac{4x}{8x+8} \cdot \frac{x^2+8x+7}{8x^3}$

10. $\frac{6x-12}{x^2-9x+18} \cdot \frac{7x-21}{5x-10}$

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Rational Expression Worksheet #7: Simplify/Multiply/Divide

Simplify (*remember to factor when necessary*).

1. $\frac{12x^6}{42x^4}$

2. $\frac{x^2 + 8x + 15}{3x + 9}$

Multiply or divide (*remember to factor when necessary*).

3. $\frac{x+3}{5x+20} \cdot \frac{x^2+3x+2}{x^2+5x+6}$

4. $\frac{x^2-x-12}{4x+12} \div \frac{x^2-6x+8}{6}$

5. $\frac{15x^2}{45x^3} \div \frac{5x^6}{9x^4}$

6. $\frac{6x+24}{5x-35} \cdot \frac{9x-63}{7x+28}$

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Rational Expression Worksheet #8: Simplify/Multiply/Divide

Simplify (*remember to factor when necessary*).

1. $\frac{18x^6}{27x^4}$

2. $\frac{x^2 + 6x + 8}{3x + 12}$

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

Multiply or divide (*remember to factor when necessary*).

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

5. $\frac{x^2-x-12}{3x+9} \div \frac{x^2+x-20}{x+5}$

6. $\frac{15x^2}{45x^3} \div \frac{5x^6}{9x^4}$

7. $\frac{6}{x^2-9x+20} \cdot \frac{5x-25}{3x-6}$

8. $\frac{6x-12}{4x^2} \cdot \frac{3x^3}{2x-4}$

9. $\frac{3x-21}{x^2-3x-28} \cdot \frac{5x+20}{2x+8}$

10. $\frac{x^2-5x-6}{2x+6} \div \frac{x^2-3x-4}{4x+12}$

11. $\frac{25xy^3}{35x^4y^2} \cdot \frac{14xy}{10x^2y^3}$

12. $\frac{4x}{x+1} \cdot \frac{x^2-6x-7}{x^2-7x}$

13. $\frac{6x-30}{x^2-7x+10} \cdot \frac{7x-14}{6x}$

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Rational Expression Worksheet #9: Adding/Subtracting

Add or subtract these rational expressions.

1. $\frac{9}{15x} + \frac{2}{15x}$

2. $\frac{5x}{7} - \frac{2x}{7}$

3. $\frac{4x}{2x+3} + \frac{7}{2x+3}$

4. $\frac{2}{5x+9} + \frac{x}{5x+9}$

5. $\frac{5}{8a} - \frac{2}{8a}$

6. $\frac{7}{x-5} - \frac{4}{x-5}$

7. $\frac{y}{y^2-9} + \frac{5}{y^2-9}$

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

9. $\frac{2}{x+1} + \frac{1}{x+1}$

10. $\frac{x-1}{3x+4} + \frac{2x+9}{3x+4}$

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

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

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Rational Expression Worksheet #10: Adding/Subtracting

Add or subtract these rational expressions. Show your common denominators and numerators on this sheet or separate paper. **FACTOR** denominators when possible.

1. $\frac{5}{8} - \frac{3}{8x}$

2. $\frac{2}{4x+12} + \frac{7}{x+3}$

3. $\frac{7}{x+2} - \frac{4}{x-5}$

4. $\frac{3}{y+5} + \frac{y}{y^2+7y+10}$

5. $\frac{5}{4x} + \frac{3}{2x}$

6. $\frac{2}{x-3} - \frac{1}{x+7}$

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Rational Expression Worksheet #11: Adding/Subtracting

Add or subtract these rational expressions. Show your common denominators and numerators on this sheet or separate paper. **FACTOR** denominators when possible.

1. $\frac{5}{6x} - \frac{2}{3}$

2. $\frac{2}{5x-20} + \frac{7}{x-4}$

3. $\frac{7}{x+2} - \frac{4}{3x+6}$

4. $\frac{3}{y+3} + \frac{2y}{y^2+7y+12}$

5. $\frac{5}{4x} + \frac{7}{12x}$

6. $\frac{2}{x-5} + \frac{3}{x-7}$

7. $\frac{3x}{x-6} + \frac{6x}{4x-24}$

8. $\frac{5}{y+10} + \frac{4y}{y^2+12y+20}$

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Rational Expression Worksheet #12: Adding/Subtracting

Add or subtract these rational expressions. Show your common denominators and numerators on this sheet or separate paper. **FACTOR** denominators when possible.

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

2. $\frac{3}{2x+6} + \frac{4}{6x+18}$

3. $\frac{3}{x+2} + \frac{4}{x-7}$

4. $\frac{1}{y+3} + \frac{4}{y^2+4y+3}$

5. $\frac{2}{5x} - \frac{3}{10x}$

6. $\frac{2x+3}{5x-30} - \frac{3x+4}{x-6}$

7. $\frac{2x}{x-11} + \frac{5}{x-11}$

8. $\frac{6x-7}{x^2+6x+5} + \frac{4}{x+5}$

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Rational Expression Worksheet #13: Solving Equations

Solve each equation for x . SHOW WORK!

$$1.) \frac{15}{x-6} + \frac{7x}{x-6} = \frac{-6}{x-6}$$

$$2.) \frac{11x}{4x+9} - \frac{14}{4x+9} = \frac{41}{4x+9}$$

$$3.) \frac{3x}{7x} + \frac{1}{7} = \frac{4}{x}$$

$$4.) \frac{2x}{3x} - \frac{5}{6} = \frac{5}{2x}$$

$$5.) \frac{1}{7(x-3)} + \frac{4}{7} = \frac{3}{(x-3)}$$

$$6.) \frac{2}{5} - \frac{7}{(x+6)} = \frac{9}{5(x+6)}$$

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Rational Expression Worksheet #14: Solving Equations

Solve each equation for x . SHOW WORK!

$$1.) \frac{-4x}{x-8} - \frac{11}{x-8} = \frac{25}{x-8}$$

$$2.) \frac{3}{4} - \frac{2x}{4x-24} = \frac{8}{x-6}$$

$$3.) \frac{3}{6x} - \frac{9}{12} = \frac{11}{4x}$$

$$4.) \frac{18}{5x+10} + \frac{4}{5} = \frac{-6}{x+2}$$

$$5.) \frac{12}{x^2+5x+6} + \frac{7}{x+3} = \frac{2}{x+2}$$

$$6.) \frac{1}{10} + \frac{4x}{5x} = \frac{-9}{2x}$$

$$7.) \frac{14}{2x-5} + \frac{7x}{2x-5} = \frac{63}{2x-5}$$

$$8.) \frac{2}{x-6} + \frac{7}{x+2} = \frac{4x+2}{x^2-4x-12}$$

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Rational Expression Worksheet Review #15: Simplify/Multiply/Divide

Simplify (*remember to factor when necessary*).

1. $\frac{24x^6y^3}{56x^4y^7}$

2. $\frac{x^2+6x+8}{5x+10}$

3. $\frac{x^2-3x-40}{x^2+2x-15}$

Multiply or divide (*remember to factor when necessary*).

4. $\frac{6x+18}{x^2+5x+4} \cdot \frac{x^2-x-2}{x^2+4x+3}$

5. $\frac{x^2-x-12}{4x+12} \div \frac{x^2+x-20}{3x+15}$

6. $\frac{35x^4}{45x^3} \div \frac{5x^6}{9x^2}$

7. $\frac{6x-24}{x^2-9x+20} \cdot \frac{5x-25}{3x-6}$

8. $\frac{7x-14}{4x^2} \cdot \frac{12x^3}{2x-4}$

9. $\frac{3x-21}{x^2-3x-28} \cdot \frac{5x+20}{2x+8}$

10. $\frac{x^2-7x-8}{2x+6} \div \frac{x^2-3x-4}{4x+12}$

11. $\frac{25xy^3}{35x^4y^2} \cdot \frac{14xy}{10x^2y^3}$

12. $\frac{4x}{x+1} \cdot \frac{x^2-6x-7}{x^2-7x}$

13. $\frac{6x+30}{x^2+7x+10} \cdot \frac{7x+14}{6x}$

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Rational Expression Worksheet Review #16 Adding/Subtracting/Solving

Add or subtract these rational expressions. Show your common denominators and numerators on this sheet or separate paper. **FACTOR** denominators when possible.

1. $\frac{3}{8x} - \frac{1}{4}$

2. $\frac{2}{6x-30} + \frac{7}{x-5}$

3. $\frac{7}{12} - \frac{4x}{3x}$

4. $\frac{3}{y+3} + \frac{2y}{y^2+8x+15}$

5. $\frac{5x}{x-7} + \frac{2x}{4x-28}$

6. $\frac{6}{y+8} - \frac{3y}{y^2+11x+24}$

Solve each equation for x. SHOW WORK!

7.) $\frac{3x}{x+7} - \frac{8}{x+7} = \frac{-23}{x+7}$

8.) $\frac{2}{5(x-8)} + \frac{4}{5} = \frac{6}{(x-8)}$

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Rational Expression Worksheet Review #17: All operations

Simplify (*remember to factor when necessary*).

1. $\frac{120x^3y}{25xy^5}$

2. $\frac{x^2 + 9x + 20}{2x + 8}$

3. $\frac{x^2 - x - 12}{x^2 - 2x - 8}$

Multiply or divide (*remember to factor when necessary*).

4. $\frac{5n+15}{4n+8} \cdot \frac{2n+4}{3n+9}$

5. $\frac{x^2 - x - 12}{x - 4} \div \frac{2x+6}{x-5}$

6. $\frac{x+3}{10x+20} \cdot \frac{x+2}{x^2+4x+3}$

Add or subtract these rational expressions.

7. $\frac{5}{12x} - \frac{3}{4}$

8. $\frac{4}{7x-35} + \frac{5}{x-5}$

Solve each equation for x . **SHOW WORK!**

9. $\frac{3x}{x+7} - \frac{8}{2(x+7)} = \frac{-22}{x+7}$

10. $\frac{2}{x-6} + \frac{7}{x+2} = \frac{4x+2}{x^2-4x-12}$