

Name _____

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

**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 #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 #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!

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

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

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

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

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

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

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

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

PRACTICE PROBLEMS SOLVING RATIONAL INEQUALITIES

Solve the inequalities and check the solutions.

1. $\frac{x-3}{x+5} \leq 0$

2. $\frac{3}{x-6} < 2$

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

4. $\frac{10}{2x+3} \leq 5$

5. $\frac{3}{2x-1} \geq \frac{-4}{x}$

Rational Equations and Inequalities Worksheet

Name _____ Per _____

Solve the following inequalities. Show work.

$$1. \frac{1}{x^2-4} \leq 0$$

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

$$3. \frac{2}{(x-1)^2} + 1 < 0$$

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

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

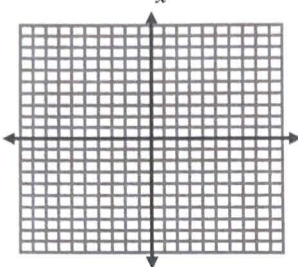
$$6. \frac{1}{(x+2)(x-3)^2} > 0$$

1. A boat travels 45 mi to an island and 45 mi back again. Changes in the wind and tide made the average speed on the return trip 3 mph slower than the speed on the way out. If the total time of the trip took 6 hr 45 min (6.75 hr), find the speed going to the island and the speed of the return trip.
2. One painter can paint a room in 6 hr. Another painter can paint the same room in 8 hr. How long would it take them working together?
3. One carpenter can complete a kitchen in 8 days. With the help of another carpenter, they can do the job together in 4 days. How long would it take the second carpenter if he worked alone?
4. A motorist travels 80 mi while driving in a bad rainstorm. In sunny weather, the motorist drives 20 mph faster and covers 120 mi in the same amount of time. Find the speed of the motorist in the rainstorm and the speed in sunny weather.
5. Brooke walks 2 km/hr slower than her older sister Adrianna. If Brooke can walk 12 km in the same amount of time that Adrianna can walk 18 km, find their speeds.

6. Gus works twice as fast as Sid. Together they can dig a garden in 4 hr. How long would it take each person working alone?
7. It takes a child 3 times longer to vacuum a house than an adult. If it takes 1 hr for one adult and one child working together to vacuum a house, how long would it take each person working alone?
8. The current in a stream is 2 mph. Find the speed of a boat in still water if it goes 26 mi downstream (with the current) in the same amount of time it takes to go 18 mi upstream (against the current).
9. A bus leaves a terminal at 9:00. A car leaves 3 hr later and averages a speed 21 mph faster than that of the bus. If the car overtakes the bus after 196 mi, find the average speed of the bus and the average speed of the car.

Graph the following for the given equations.

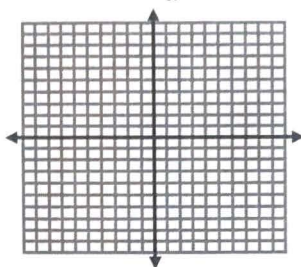
1. $y = \frac{1}{x}$



Vertical Asymptote: _____

Horizontal Asymptote: _____

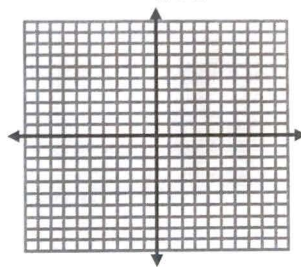
2. $y = \frac{1}{x} + 2$



Vertical Asymptote: _____

Horizontal Asymptote: _____

3. $y = \frac{1}{x+2}$

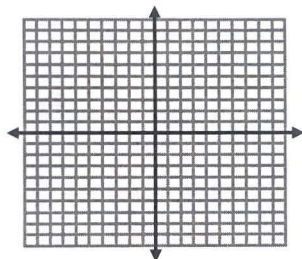


Vertical Asymptote: _____

Horizontal Asymptote: _____

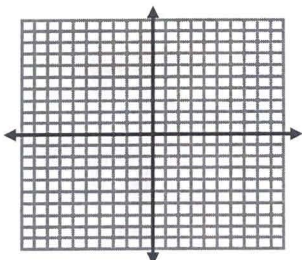
Graph the function and label the following information. Horizontal Asymptotes can include slant asymptotes.

4. $y = \frac{x^2 + 4x - 5}{x + 1}$



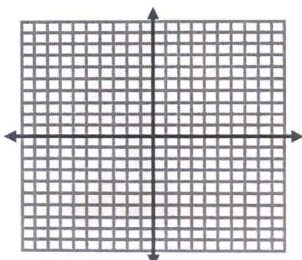
Zeros:	
Vertical Asymptotes:	
Horizontal Asymptotes:	
Holes:	
Y-Intercept(s):	
Domain:	
range	

5. $y = \frac{x^2 + 5x + 6}{x^2 - 9}$



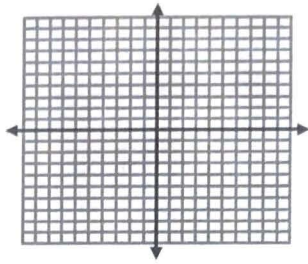
Zeros:	
Vertical Asymptotes:	
Horizontal Asymptotes:	
Holes:	
Y-Intercept(s):	
Domain:	
range	

6. $y = \frac{x^2 - 4}{3x^2 - 15x + 18}$



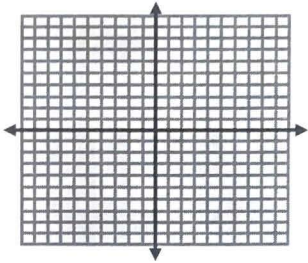
Zeros:	
Vertical Asymptotes:	
Horizontal Asymptotes:	
Holes:	
Y-Intercept(s):	
Domain:	
range	

$$7. y = \frac{5}{(x-2)^2}$$



Zeros:	
Vertical Asymptotes:	
Horizontal Asymptotes:	
Holes:	
Y-Intercept(s):	
Domain:	
range	

$$8. f(x) = \frac{1}{x+4} - 3$$



Zeros:	
Vertical Asymptotes:	
Horizontal Asymptotes:	
Holes:	
Y-Intercept(s):	
Domain:	
range	

Match the following graphs with the equation

$$9. f(x) = \frac{x^3 - 9x}{3x^2 - 6x - 9}$$

$$10. f(x) = \frac{x^2 - x - 12}{x^2 - 2x - 8}$$

$$11. f(x) = \frac{x^3 + 1}{x^2 - 1}$$

factor _____

HA: _____

VA: _____

roots: _____

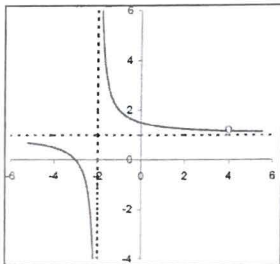
holes: _____

graph: A B C

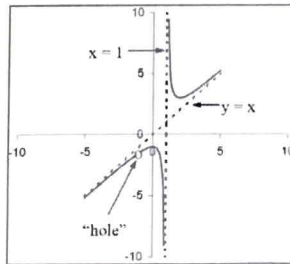
graph: A B C

graph: A B C

A.



B.



C.

