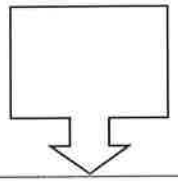


Name \_\_\_\_\_

## Honors Math III - Unit 4 - Rational Functions



Date	Lesson/Objective	Homework
Mon. Oct. 16	<i>Multiply and Divide Rational Expressions</i>	4-1
Tues. Oct. 17	<i>Add and Subtract Rational Expressions</i>	4-2
Wed. Oct. 18	<i>Solve Rational Equations</i>	4-3
Thurs. Oct. 19	<i>Review</i>	REVIEW WS
Fri. Oct. 20	<b><i>Test- Unit 4 Part 1 Test</i></b>	

# HW 4-1

## Practice

Form G

### Rational Expressions

Simplify each rational expression. State any restrictions on the variables.

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

2.  $\frac{2y}{y^2 + 6y}$

3.  $\frac{20 + 40x}{20x}$

4.  $\frac{7x - 28}{x^2 - 16}$

5.  $\frac{3y^2 - 3}{y^2 - 1}$

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

7.  $\frac{x^2 + 3x - 18}{x^2 - 36}$

8.  $\frac{x^2 + 13x + 40}{x^2 - 2x - 35}$

1-23  
odd

Multiply. State any restrictions on the variables.

9.  $\frac{5a}{5a + 5} \cdot \frac{10a + 10}{a}$

10.  $\frac{2x + 4}{10x} \cdot \frac{15x^2}{x + 2}$

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

12.  $\frac{x^2 - 6x}{x^2 - 36} \cdot \frac{x + 6}{x^2}$

13.  $\frac{5y - 20}{3y + 15} \cdot \frac{7y + 35}{10y + 40}$

14.  $\frac{x - 2}{(x + 2)^2} \cdot \frac{x + 2}{2x - 4}$

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

16.  $\frac{y^2 - 2y}{y^2 + 7y - 18} \cdot \frac{y^2 - 81}{y^2 - 11y + 18}$

Divide. State any restrictions on the variables.

17.  $\frac{7x^4}{24y^5} \div \frac{21x}{12y^4}$

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

19.  $\frac{5y}{2x^2} \div \frac{5y^2}{8x^2}$

20.  $\frac{3y + 3}{6y + 12} \div \frac{18}{5y + 5}$

21.  $\frac{y^2 - 49}{(y - 7)^2} \div \frac{5y + 35}{y^2 - 7y}$

22.  $\frac{x^2 + 10x + 16}{x^2 - 6x - 16} \div \frac{x + 8}{x^2 - 64}$

23.  $\frac{y^2 - 5y + 4}{y^2 - 1} \div \frac{y^2 - 9}{y^2 + 5y + 4}$

24.  $\frac{x^2 - 4}{x^2 + 6x + 9} \div \frac{x^2 + 4x + 4}{x^2 - 9}$

HW  
4-2

Practice

Form G

Adding and Subtracting Rational Expressions

DO 1-18

Find the least common multiple of each pair of polynomials.

1.  $3x(x + 2)$  and  $6x(2x - 3)$

2.  $2x^2 - 8x + 8$  and  $3x^2 + 27x - 30$

3.  $4x^2 + 12x + 9$  and  $4x^2 - 9$

4.  $2x^2 - 18$  and  $5x^3 + 30x^2 + 45x$

Simplify each sum or difference. State any restrictions on the variables.

5.  $\frac{x^2}{5} + \frac{x^2}{5}$

6.  $\frac{6y - 4}{y^2 - 5} + \frac{3y + 1}{y^2 - 5}$

7.  $\frac{2y + 1}{3y} + \frac{5y + 4}{3y}$

8.  $\frac{12}{xy^3} - \frac{9}{xy^3}$

9.  $-\frac{2}{n + 4} - \frac{n^2}{n^2 - 16}$

10.  $\frac{3}{8x^3y^3} - \frac{1}{4xy}$

11.  $\frac{6}{5x^2y} + \frac{5}{10xy^2}$

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

13.  $\frac{4}{x^2 - 25} + \frac{6}{x^2 + 6x + 5}$

14.  $\frac{y}{4y + 8} - \frac{1}{y^2 + 2y}$

Simplify each complex fraction.

15.  $\frac{\frac{2}{x}}{\frac{3}{y}}$

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

17.  $\frac{\frac{1}{x - 2}}{2 + \frac{1}{x}}$

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

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

20.  $\frac{1 + \frac{2}{3}}{\frac{4}{9}}$

21.  $\frac{\frac{2}{x} + 6}{\frac{1}{y}}$

22.  $\frac{\frac{x + 3}{x - 3}}{\frac{x^2 - 9}{3x - 9}}$

23.  $\frac{\frac{5}{x + 3}}{2 + \frac{1}{x + 3}}$

# HW 4-3

## Standardized Test Prep

\* 2 pages.

### Solving Rational Equations

#### Gridded Response

For Exercises 1-8, what are the solutions of each rational equation? Enter your answer in the grid provided. If necessary, enter your answer as a fraction.

1.  $\frac{3-x}{6} = \frac{6-x}{12}$

2.  $\frac{2}{6x+2} = \frac{x}{3x^2+11}$

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

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

5.  $\frac{7}{x^2-5x} + \frac{2}{x} = \frac{3}{2x-10}$

6.  $\frac{1}{4-5x} = \frac{3}{x+9}$

7.  $\frac{7}{2} = \frac{7x}{8} - 4$

8.  $4 + \frac{2y}{y-5} = \frac{8}{y-5}$

Do 1-8

and

Do 14-18

#### Answers

1.

2.

3.

4.

5.

6.

7.

8.

HW  
4-3  
(Cont)

Class \_\_\_\_\_

Date \_\_\_\_\_

Practice (continued)

Form K

Solving Rational Equations

11. You can travel 40 mi on your motorbike in the same time it takes your friend to travel 15 mi on his bicycle. If your friend rides his bike 20 mi/h slower than you ride your motorbike, find the speed for each bike.
  
12. A passenger train travels 392 mi in the same time that it takes a freight train to travel 322 mi. If the passenger train travels 20 mi/h faster than the freight train, find the speed of each train.
  
13. You can paint a fence twice as fast as your sister can. Working together, the two of you can paint a fence in 6 h. How many hours would it take each of you working alone?

Solve each equation. (Check each solution.)

14.  $\frac{2}{x-3} - \frac{4}{x+3} = \frac{8}{x^2-9}$

15.  $\frac{3}{x+5} + \frac{2}{5-x} = \frac{-4}{x^2-25}$

16.  $\frac{3}{x^2-1} + \frac{4x}{x+1} = \frac{1.5}{x-1}$

17. You are planning a school field trip to a local theater. It costs \$60 to rent the bus. Each theater ticket costs \$5.50.
  - a. Write a function  $c(x)$  to represent the cost per student if  $x$  students sign up for the trip.
  - b. How many students must sign up if the cost is to be no more than \$10 per student?

## Unit 4 Review

### Multiply/Divide

$$6. \frac{5y-20}{3y+15} \cdot \frac{7y+35}{10y+40}$$

$$9. \frac{x^2-3x-10}{2x^2-11x+5} \div \frac{x^2-5x+6}{2x^2-7x+3}$$

$$7. \frac{x^2+10x+16}{x^2-6x-16} \div \frac{x+8}{x^2-64}$$

$$10. \frac{x^2+6x}{3x^2+6x-24} \cdot \frac{x^2+2x-8}{x+6}$$

$$8. \frac{3x+3}{6x+12} \div \frac{18}{5x+5}$$

$$11. \frac{(y+6)^2}{y^2-36} \cdot \frac{3y-18}{2y+12}$$

### Add/Subtract.

$$12. \frac{3}{x^2+3x-10} + \frac{1}{x^2+6x+5}$$

$$13. \frac{x+2}{x^2+4x+4} + \frac{2}{x+2}$$

$$14. \frac{3x-2}{x-2} + \frac{5}{x+2}$$

$$15. \frac{6}{5x^2} + \frac{7}{10x}$$

$$16. \frac{9}{x^2-1} - \frac{x-2}{x+1}$$

$$17. \frac{x}{x^2+5x+6} - \frac{2}{x^2+3x+2}$$

### Simplify.

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

$$19. \frac{\frac{20}{x+1}}{\frac{1}{4} - \frac{7}{x+1}}$$

$$20. \frac{\frac{4}{x^2-9} + \frac{2}{x-3}}{\frac{1}{x+3} + \frac{1}{x-3}}$$

### Solving each equation and check your answers

$$21. \frac{3}{2x-4} = \frac{5}{3x+7}$$

$$22. \frac{3x}{4} = \frac{x^2-4x}{4x}$$

$$23. \frac{7}{x^2-5x} + \frac{2}{x} = \frac{3}{2x-10}$$

$$24. \frac{x+2}{x-1} + \frac{4}{x-5} = \frac{6}{x^2-6x+5}$$

$$25. \frac{5}{x+2} + \frac{x}{x-2} = \frac{8}{x^2-4}$$

$$26. \frac{4x}{x+3} + x = \frac{8}{x+3}$$

## Simplifying Rational Expressions Homework



**Directions:** Simplify each rational expression. State any restrictions on the variables. Pay close attention to the sign between the rational expressions!

1.  $\frac{3x-6}{5x-20} \cdot \frac{x-8}{5x-10}$

2.  $\frac{y^2-25}{y^2-16} \div \frac{2y+10}{y^2-4y}$

3.  $\frac{14x+7}{4x-6} \cdot \frac{8x-12}{42x+21}$

4.  $\frac{8}{3x^3y} + \frac{4}{9xy^3}$

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

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

7.  $\frac{7}{5y+25} - \frac{4}{3y+15}$

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

9.  $\frac{2x+4}{3x-3} \cdot \frac{12x-12}{x+5}$

10.  $\frac{7}{2xy^2} + \frac{3}{8x^2y}$

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

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