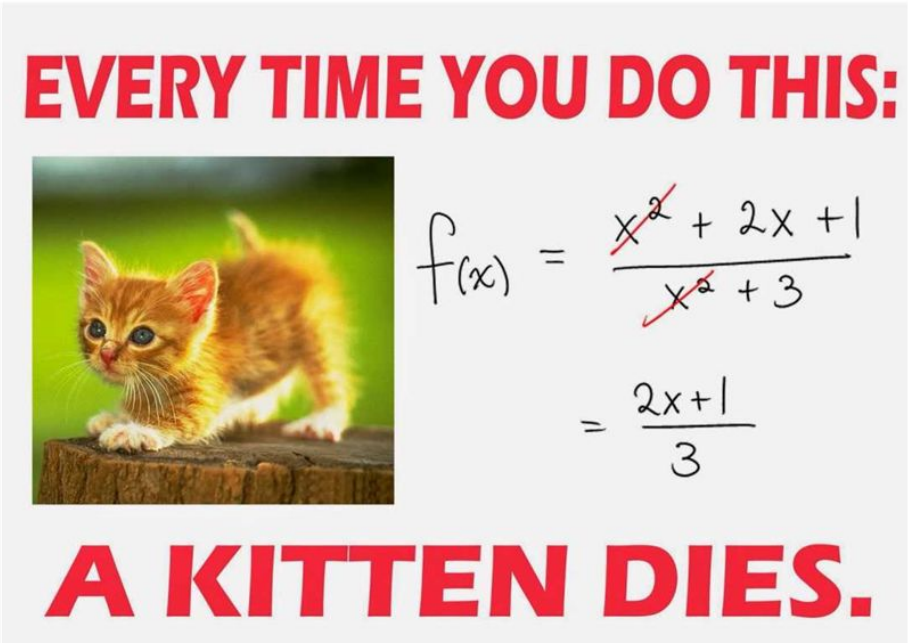
NAME _____

FOM 3

Unit 4: Rational Expressions



Date	Topic	Homework
October 16	● Simplify rational expressions	worksheet 4.1
October 17	● Multiply and divide rational expressions	worksheet 4.2
October 18	● Determine vertical asymptotes, holes, and domain	worksheet 4.3
October 19	● Quiz!!	worksheet 4.4
October 20	● Determine horizontal asymptotes	worksheet 4.5
October 23	● Add rational expressions with common denominators	worksheet 4.6
October 24	● Review for test	Quadratics Review
October 25	● Test!!	

4.1 - Simplify Rational Expressions

Simplify each rational expression. Remember to factor FIRST!!

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

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

3. $\frac{x^2-11x+18}{x^2+2x-8}$

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

5. $\frac{x^3-x^2-42x}{2x^2-20x+42}$

6. $\frac{x^2-5x-14}{x^2-49}$

7. $\frac{2x^2+10x-48}{8x+64}$

8. $\frac{3x^2-6x-144}{x^2-36}$

4.2 - Multiply and Divide Rational Expressions

Simplify each rational expression. Pay close attention to whether you are multiplying or dividing!!

1. $\frac{x^2-2x-15}{8x+20} \div \frac{2}{4x+10}$

2. $\frac{x+3}{3x^2+4x-15} \cdot \frac{4x^2-9}{2x+3}$

3. $\frac{x^2-16}{x+3} \div (x-4)$

4. $\frac{x+2}{x} \cdot \frac{6x-30}{3x^2-12}$

5. $\frac{1}{x+10} \cdot \frac{10x+30}{x+3}$

6. $\frac{x^2+9x+18}{x^2-9} \div \frac{x+6}{x-6}$

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

8. $\frac{x^2+2x-3}{x^2-5x+4} \div \frac{x^2-9}{x^2-2x-8}$

4.3 - Vertical Asymptotes, Holes, and Domain

Determine the vertical asymptotes, holes, and domain for each rational function. Remember to factor first!!

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

2. $f(x) = \frac{5x+2}{2x^2-3x-20}$

3. $f(x) = \frac{x^2-5x-14}{3x^2+2x-16}$

4. $f(x) = \frac{6x^2-38x-28}{x-7}$

Mixed Rational Expression Practice

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

6. $\frac{x+3}{2x+3} \cdot \frac{4x^2-9}{3x^2+11x+6}$

7. $\frac{x^2-2x-35}{2x^2-50}$

8. $\frac{x+4}{x-4} \div (x^2 + 8x + 16)$

4.4 - Practice with Rational Expressions

Simplify each rational expression.

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

2. $\frac{x-3}{x^2-4} \cdot \frac{x+2}{x^2-6x+9}$

3. $\frac{3x-9}{x^2-x-20} \div \frac{x^2+2x-15}{x^2-25}$

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

5. $\frac{x^2-2x-35}{2x^3-3x^2} \cdot \frac{4x^3-9x}{7x-49}$

6. $\frac{x^2-16}{x^2-10x+25} \div \frac{3x-12}{x^2-3x-10}$

7. $\frac{6x^2-x-1}{2x^2+7x+3} \cdot \frac{6x^2+3x}{9x^2-1}$

8. $\frac{x^2+2x-35}{x^2-10x+25} \div \frac{x^2-49}{x^2+x-30}$

4.5 - Horizontal Asymptotes

Determine the horizontal asymptote of each rational function.

1. $f(x) = \frac{8x^3+5x^2-4}{6x^3+2x}$

2. $f(x) = \frac{9}{9x+3}$

3. $f(x) = \frac{x^3+3x^2-5x+4}{x^2+2x+1}$

4. $f(x) = \frac{5x^2+3}{x^2-2}$

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

6. $f(x) = \frac{8x^4-9x^3}{2x^2+3x-9}$

7. $f(x) = \frac{12x-4}{3x-2}$

8. $f(x) = \frac{8x^2+3x}{12x^3-7}$

9. $f(x) = \frac{4x^3-2x^2+9x-6}{4x^4}$

10. $f(x) = \frac{5x^7+2x^4+x}{3x^7-6x+1}$

4.6 - Adding Rational Expressions (Common Denominator)

Simplify each rational expression.

1. $\frac{x}{x^2-25} + \frac{5}{x^2-25}$

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

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

4. $\frac{2}{6x+10} + \frac{2x-6}{6x+10}$

5. $\frac{3x+22}{x^2-100} + \frac{4x-1}{x^2-100}$

6. $\frac{-3x^2+4x-42}{3x^2+13x-30} + \frac{4x^2-5x}{3x^2+13x-30}$

Determine the vertical asymptotes, holes, domain, and horizontal asymptotes of each function.

7. $f(x) = \frac{x^2-4x-21}{x^2+7x+10}$

8. $f(x) = \frac{x^2-64}{x-4}$