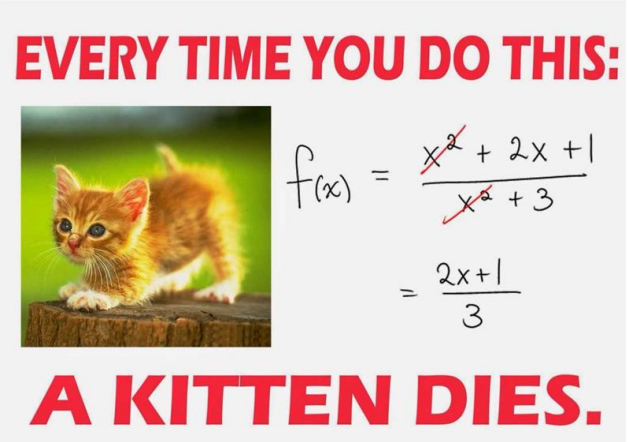
Name _____

# FOM 3 Unit 5: Rational Expressions




| Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|
| | | | **October 24**<br>• Simplify rational expressions<br>HW: worksheet 5.1 | **October 25**<br>• Multiply and divide rational expressions<br>HW: worksheet 5.2 |
| **October 28**<br>• Domain, vertical asymptotes, and holes<br>HW: worksheet 5.3 | **October 29**<br>• Mixed practice<br>HW: worksheet 5.4 | **October 30**<br>• QUIZ!!<br>• Horizontal asymptotes<br>HW: worksheet 5.5 | **October 31**<br>• Add and subtract rational expressions with common denominators<br>HW: worksheet 5.6 | **November 1**<br>• No School - Teacher Workday |
| **November 4**<br>• Review for test<br>HW: finish review | **November 5**<br>• Practice Test | **November 6**<br>• TEST!!! | | |

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

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

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

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

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

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