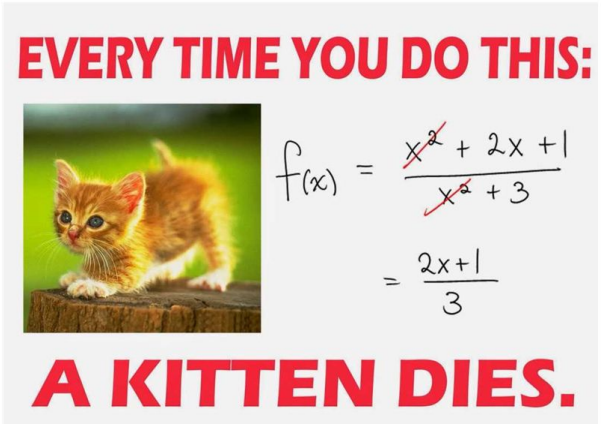
Name _____

Math 3 Unit 7: Rationals

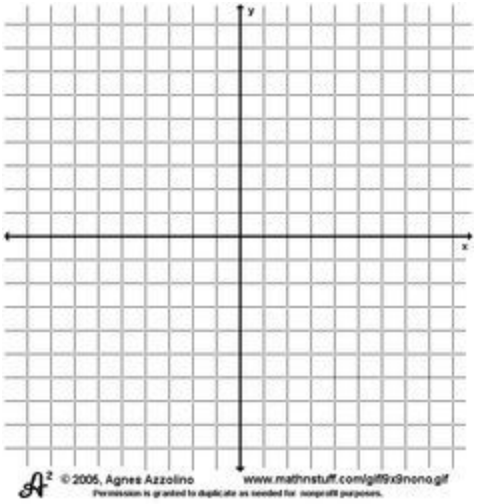


April 23 • Simplify rational expressions HW: worksheet 7.1	**April 24** • Multiply and divide rational expressions HW: worksheet 7.2	**April 25** • Add and subtract rational expressions with common denominators HW: worksheet 7.3	**April 26** • Add and subtract rational expressions HW: worksheet 7.4	**April 27** • QUIZ!! • Solve rational equations HW: worksheet 7.5
April 30 • Solve rational expressions HW: worksheet 7.6	**May 1** • Asymptotes and holes of rational functions HW: worksheet 7.7	**May 2** • Graph rational functions HW: worksheet 7.8	**May 3** • Review for test HW: finish review	**May 4** • TEST!!!

7.8 - Graph Rational Functions

For each rational function, determine the holes, vertical asymptotes, domain, and horizontal asymptote. Then graph the rational function.

1. $f(x) = \frac{4}{x-5}$



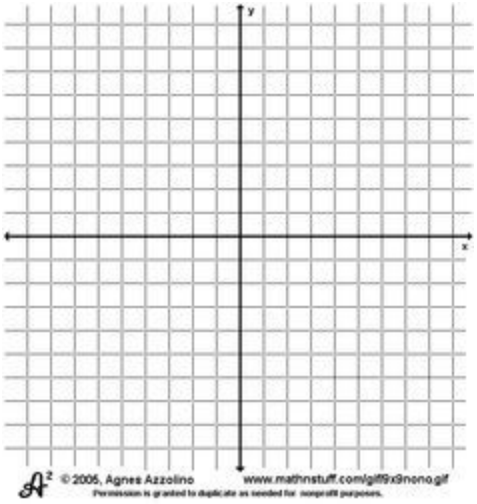
Holes: _____

VA: _____

Domain: _____

HA: _____

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



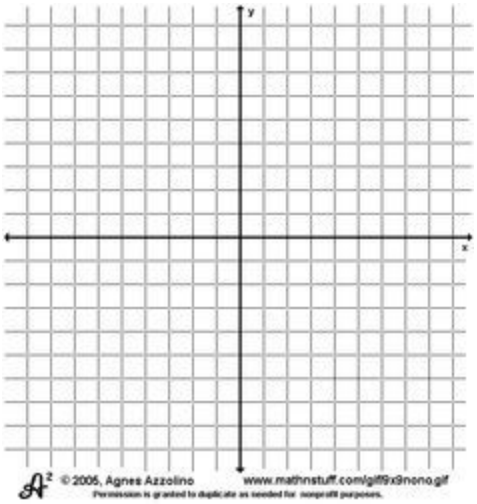
Holes: _____

VA: _____

Domain: _____

HA: _____

3. $f(x) = \frac{2}{x^2+3x-10}$

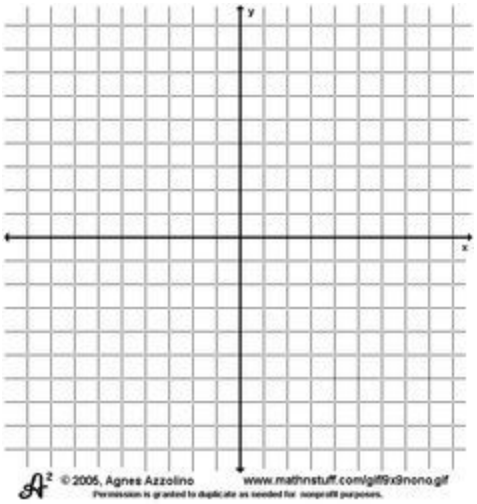


Holes: _____

VA: _____

Domain: _____

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



Holes: _____

VA: _____

Domain: _____

HA: _____ HA: _____

7.1 - Simplifying Rational Expressions

Simplify each rational expression.

1. $\frac{27}{27x+18}$

2. $\frac{v^2-7v-30}{v^2-5v-24}$

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

4. $\frac{b^2+3b-28}{b^2-49}$

5. $\frac{4n-4}{6n-20}$

6. $\frac{2v^2+10v-48}{8v+64}$

7. $\frac{6v^3+42v^2}{2v^2+26v+84}$

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

9. $\frac{9x^2+81x}{x^3+8x^2-9x}$

7.2 - Multiply and Divide Rational Expressions

Simplify each rational expression.

1. $\frac{k+9}{(k-8)(k-7)} \cdot \frac{(k-7)(k+1)}{k+1}$

2. $\frac{9(m+7)}{(m+4)(m+7)} \div \frac{9}{8(m+4)}$

3. $\frac{6(r+7)}{2r} \cdot \frac{20}{10(r+7)}$

4. $\frac{a^2-9a+20}{a^2-16} \cdot \frac{a^2+5a+4}{2a-10}$

5. $\frac{x^2+5x-36}{2x-6} \div (x-4)$

6. $\frac{6n+24}{14n-4} \div \frac{8n+32}{14n-4}$

7. $\frac{x^2-15x+54}{x^2-14x+48} \div \frac{1}{x-8}$

8. $(b+6) \cdot \frac{10b}{2b+12}$

9. $\frac{3x-9}{x-6} \div \frac{x^2-11x+24}{x^2-36}$

7.7 - Asymptotes and Holes of Rational Functions

For each rational function, determine the holes, vertical asymptotes, domain, and horizontal asymptote.

	Holes:	**Vertical Asymptotes:**	**Domain:**	**Horizontal Asymptote:**
1. $f(x) = \frac{5(x-3)(x+3)}{6(x+3)(x-6)}$				
2. $f(x) = \frac{6(x-1)(x+9)(x-8)(x+7)}{(x+9)(x+7)(x-3)}$				
3. $f(x) = \frac{2(x+3)(x+4)}{7x(3x+7)(x-3)}$				
4. $f(x) = \frac{3x-12}{x^2-2x-8}$				
5. $f(x) = \frac{-4x+16}{x-4}$				
6. $f(x) = \frac{x+2}{2x+6}$				
7. $f(x) = \frac{x^3-9x}{3x^2-6x-9}$				
8. $f(x) = \frac{x-4}{x^2-4}$				

7.6 - Solve Rational Equations with Extraneous Solutions

Solve for the variable.

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

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

3. $\frac{3}{x} = \frac{12}{x+7}$

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

4. $\frac{10}{6x+7} = \frac{6}{2x+9}$

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

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

8. $\frac{10}{2y+8} - \frac{7y+8}{y^2-16} = \frac{-8}{2y-8}$

7.3 - Add and Subtract Rational Expressions with Common Denominators

Simplify each rational expression.

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

2. $\frac{7}{8a} - \frac{3}{8a}$

3. $\frac{2}{5x+9} + \frac{x+3}{5x+9}$

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

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

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

7. $\frac{m-3n}{6m^3n} - \frac{m+3n}{6m^3n}$

8. $\frac{u-v}{8v} - \frac{6u-3v}{8v}$

9. $\frac{2r+6}{3r-6} + \frac{r+3}{3r-6}$

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

11. $\frac{5}{a^2+3a+2} + \frac{6a+1}{a^2+3a+2}$

12. $\frac{x+2}{2x^2+13x+20} - \frac{x+3}{2x^2+13x+20}$

7.4 - Add and Subtract Rational Expressions

Simplify each rational expression.

1. $\frac{6}{x^2+11x+30} - \frac{7x}{x+5}$

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

3. $\frac{5}{h+3} + \frac{5}{h^2-9}$

4. $\frac{x+2}{x^2-10x+16} + \frac{x-3}{x-8}$

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

6. $\frac{r^3-4}{8rs^2} - \frac{r^2+7}{12r^3}$

7. $\frac{3}{x+7} + \frac{4}{x-8}$

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

9. $\frac{x+7}{x^2+x-56} - \frac{x+8}{x^2-49}$

7.5 - Solve Rational Equations

Solve for the variable.

1. $\frac{3}{x-7} = \frac{2}{4x+1}$

2. $\frac{7}{x+1} = \frac{6}{x-5}$

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

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

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

6. $\frac{3}{x+4} = \frac{x-4}{16}$

7. $\frac{x}{x+24} = \frac{2}{x}$

8. $\frac{x+3}{x+1} = \frac{15}{x+7}$