

Name _____

Math 3 Unit 4: Rational Expressions

EVERY TIME YOU DO THIS:



$$f(x) = \frac{\cancel{x^2} + 2x + 1}{\cancel{x^2} + 3}$$

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

A KITTEN DIES.

				<p>March 1</p> <ul style="list-style-type: none"> Simplify rational expressions <p>HW: 4.1</p>
<p>March 4</p> <ul style="list-style-type: none"> Multiply and divide rational expressions <p>HW: 4.2</p>	<p>March 5</p> <ul style="list-style-type: none"> Add and subtract rational expressions with common denominators <p>HW: 4.3</p>	<p>March 6</p> <ul style="list-style-type: none"> Add and subtract rational expressions <p>HW: 4.4</p>	<p>March 7</p> <ul style="list-style-type: none"> QUIZ!! Solve rational equations <p>HW: 4.5</p>	<p>March 8</p> <ul style="list-style-type: none"> Solve rational expressions <p>HW: 4.6</p>
<p>March 11</p> <ul style="list-style-type: none"> Asymptotes and holes of rational functions <p>HW: 4.7</p>	<p>March 12</p> <ul style="list-style-type: none"> Graph rational functions <p>HW: 4.8</p>	<p>March 13</p> <ul style="list-style-type: none"> Review for test <p>HW: finish review</p>	<p>March 14</p> <ul style="list-style-type: none"> TEST!!! 	

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

4.2 - Multiply and Divide Rational Expressions

Simplify each rational expression.

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

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

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

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

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

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

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

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

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

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

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

4.5 - Solve Rational Equations

Solve for the variable.

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

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

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

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

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

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

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

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

4.6 - Solve Rational Equations with Extraneous Solutions

Solve for the variable.

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

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

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

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

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

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

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

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

4.7 - Asymptotes and Holes of Rational Functions

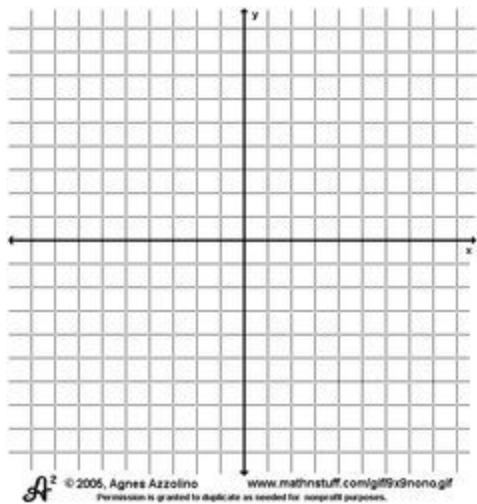
For each rational function, determine the holes, vertical asymptotes, domain, and horizontal asymptote.

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

4.8 - Graph Rational Functions

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

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



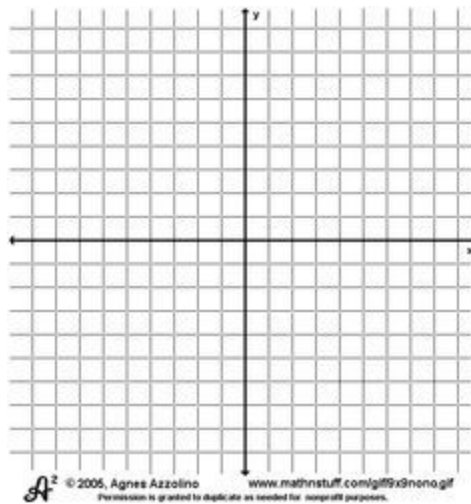
Holes: _____

VA: _____

Domain: _____

HA: _____

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



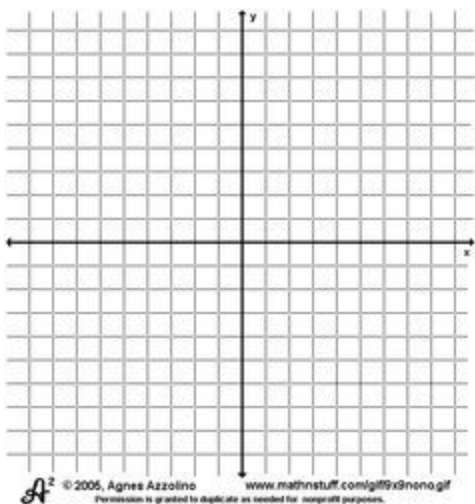
Holes: _____

VA: _____

Domain: _____

HA: _____

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



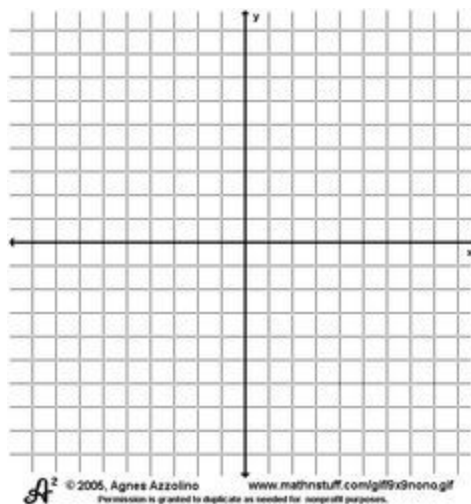
Holes: _____

VA: _____

Domain: _____

HA: _____

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



Holes: _____

VA: _____

Domain: _____

HA: _____