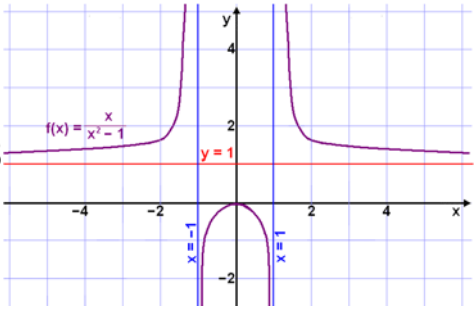
Math 4R

Rational Functions Graphing Techniques Homework



_____**HW #37:** Pg 1-2 – Practice Worksheet 3-8

_____**HW #38:** Pg 3 – Asymptotes Homework

_____**HW #39:** Pg 4-5 – More Asymptotes Homework

_____**HW #40:** Pg 6 – Complete Analysis Homework

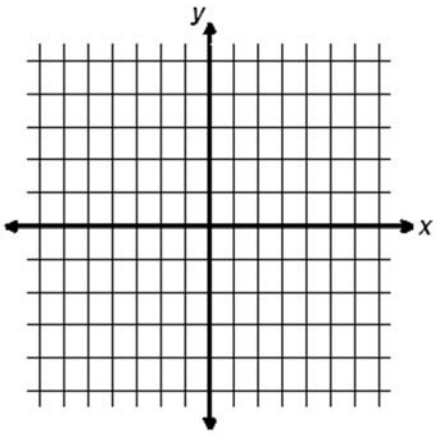
_____**HW #41:** Pg 7-8 – Rational Functions & Asymptotes Practice

3-8 Practice Worksheet

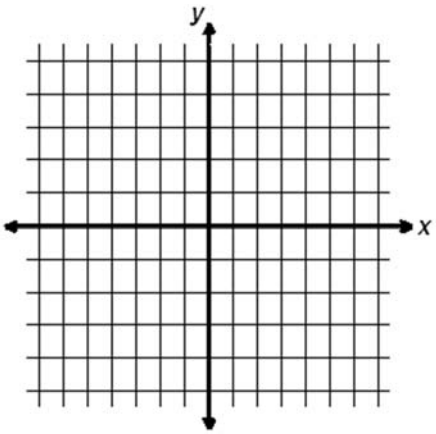
Continuity and End Behavior

Determine whether each graph has infinite discontinuity, jump discontinuity, or point discontinuity, or is continuous. Then graph each function.

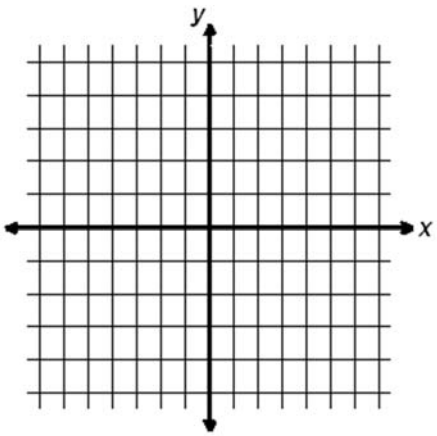
1. $y = \frac{2}{3x^2}$



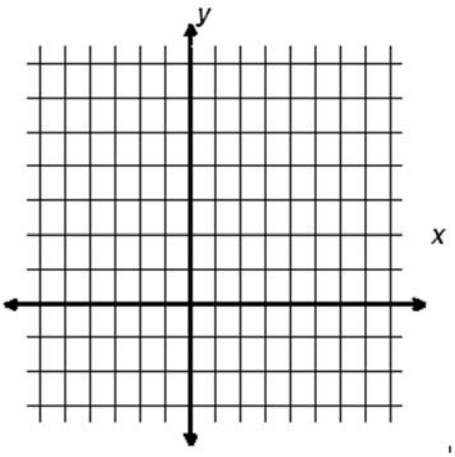
2. $y = \frac{x^2-1}{x+1}$



3. $y = \frac{|x|^2}{x}$



4. $y = 2x^2 - 4x + 1$



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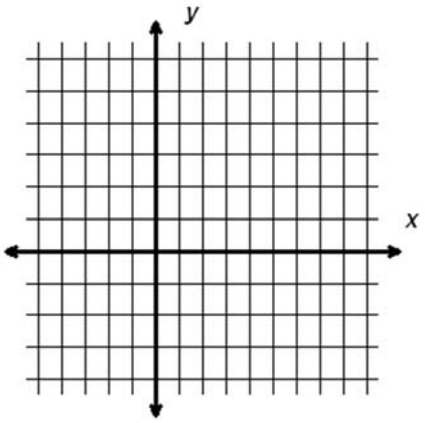
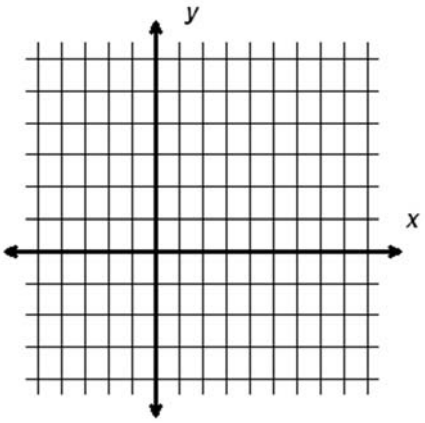
5. $y = x^3 - 2x + 2$



6. $y = \begin{cases} 2x + 1, & x < 0 \\ 2x + 2, & x > 0 \end{cases}$



Without graphing, describe the end behavior of each function.

7. $y = 2x^5 - 4x$

8. $y = -x^2 + 13$

9. $y = 6 - 6x - 6x^3$

10. $y = x^3 + 2x - 1$

11. $y = x^2 - 49$

12. $y = x^4 + x^3 + x^2 + x$

Asymptotes Homework

For problems 1 – 3, determine the equation(s) of the vertical asymptotes of each function and find the coordinates of any holes that exist in the graph. If a function does not have a vertical asymptote or a hole, explain why it does not. Show your work.

1. $f(x)=\frac{3x^2+10x+8}{x^2-2x-8}$	2. $g(x)=\frac{2x^2-5x+2}{x^2-4}$	3. $h(x)=\frac{2x-6}{x^2-x-2}$

For problems 4 – 9, determine the equation of the horizontal asymptote of the function. If the function does not have a horizontal asymptote, explain why it does not.

4. $f(x)=\frac{3x^2+10x+8}{x^2-2x-8}$	5. $h(x)=\frac{2x-6}{x^2-x-2}$	6. $p(x)=\frac{2x-3x^2}{2x^2-x-3}$
7. $h(x)=\frac{-2x^2-5x-2}{2x^2-7x+3}$	8. $f(x)=\frac{2x^2+8}{-2x-8}$	9. $f(x)=\frac{3}{x-8}$

More Asymptotes Homework

For each of the following rational functions, determine the vertical asymptotes(infinite discontinuities) and identify any removable/point discontinuities (holes).

1. $f(x)=\dfrac{(x+3)(x-3)}{(x-5)(x+3)}$

2. $g(x)=\dfrac{x^2-1}{x^2+6x+5}$

3. $p(x)=\dfrac{10x-6x^2}{x^2+3x-10}$

For each of the following rational functions, identify the coordinates of any removable/point discontinuities, if they exist. If they do not exist, state why.

5. $F(x)=\dfrac{2x^2+5x-3}{x^2-9}$

6. $h(x)=\dfrac{3x^2-6x}{x^2-4}$

7. $G(x)=\dfrac{x^2+4x-5}{x^2-x-6}$

For each of the following rational functions, determine the equation of the horizontal asymptote. If a function does not have a horizontal asymptote, state why.

8. $F(x)=\dfrac{2x^2+5x-3}{x^2-9}$

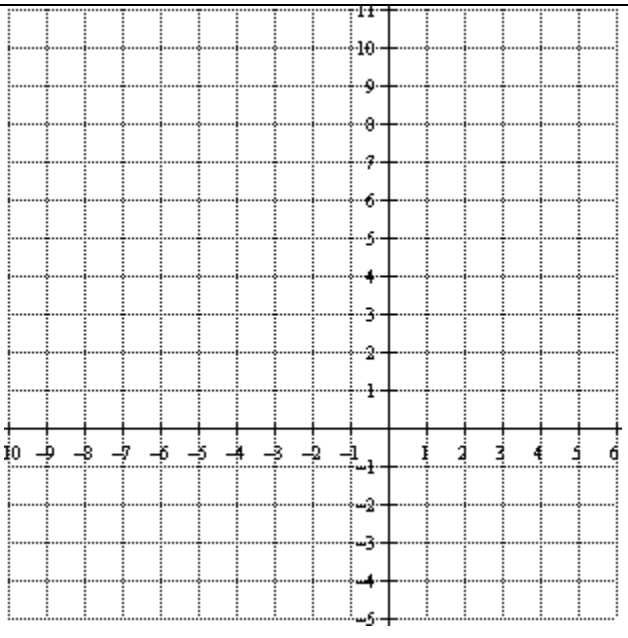
9. $H(x)=\dfrac{3-2x-4x^2}{2x^3-3x}$

10. $g(x)=\dfrac{3x-2x^2}{3x^2+4x}$

11. $P(x)=\dfrac{(3-2x)(x+3)}{(2+x)(3-x)}$

{OVER}

12. Use the function $g(x) = \dfrac{3x^2 + 5x + 2}{x^2 + 4x + 3}$ to answer the following questions.

What is the equation of the function written in completely factored form?	
If any exist, identify the vertical asymptotes? Explain how you know that they are vertical asymptotes.	
Does the function have any holes in the graph? Explain why or why not. What are the coordinates where the hole(s) exist(s)?	
If any exist, identify the horizontal asymptotes. Explain how you know that they are horizontal asymptotes.	
What is/are the zero(es) of the function? Show your work.	
What are the domain and range of the function? Give your answer in interval notation.	
Sketch a detailed graph of the function on the grid to the right. You will need to use a minimum of 6 points—3 points on each branch.	

Complete Analysis Homework

Do a complete analysis and graph the given function.

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

Intercepts

x-int.:_____

y-int.:_____

Asymptotes

Vert.:_____

Horiz.:_____

Hole:_____

Extent:

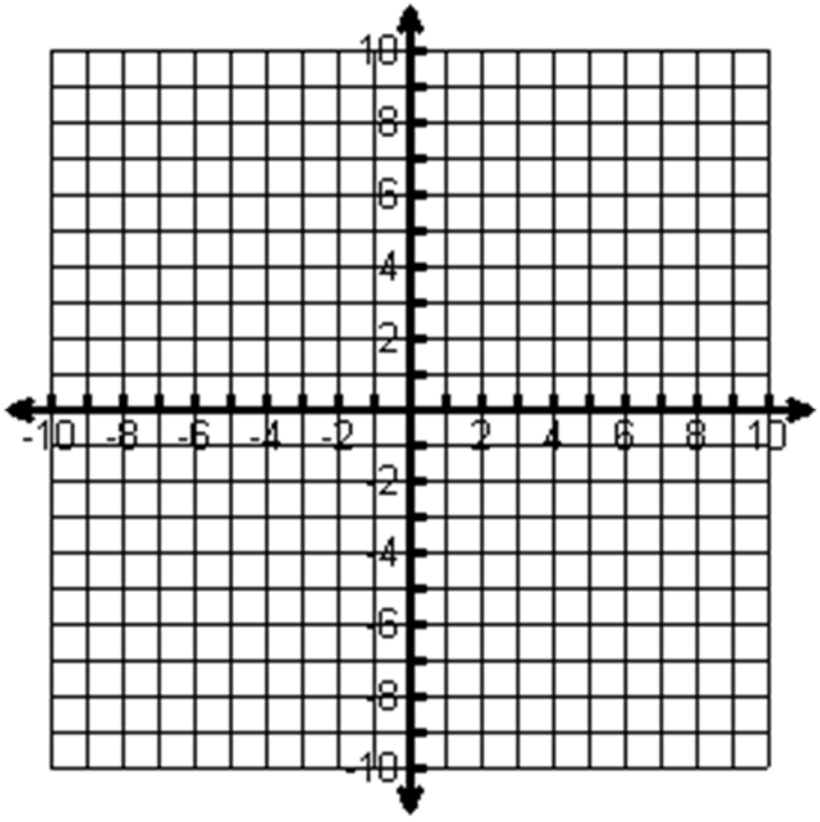
Domain:_____

Range:_____

End Behavior:

Maximum(s)

Minimum(s)



Rational Functions & Asymptotes Practice

I. Determine any holes and vertical or horizontal asymptotes in the graph of each function.

1. $y = \frac{x}{x^2+2x+1}$

2. $y = \frac{x-1}{x^5-4x^3}$

3. $y = \frac{5x^2-10x+1}{x-2}$

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

{OVER}

II. Do a complete analysis and graph the given function.

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

Intercepts

x-int.:_____

y-int.:_____

Asymptotes

Vert.:_____

Horiz.:_____

Hole:_____

Extent:

Domain:_____

Range:_____

End Behavior:

Maximum(s)

Minimum(s)