

8.3 Graphing Rational Functions (H.A. & V.A.)

Get your calculators ready . . .

First, clear calculator:

Then, **2nd WINDOW** arrow down to **Indpnt:** and select **ASK**



Transformation Form -----> Standard Form of Rational Functions

Find a common denominator and add the rational expressions.

$$f(x) = \frac{-7}{x+5} + 2$$

1. Enter $\frac{2x+3}{x+5}$ into y_1 .

Complete the table below.

X	Y ₁
50	
75	
100	
200	
300	

C

O

C

O



What number does the y_1 get very close to?

This number is the horizontal asymptote. As x gets bigger, the y value approaches or gets very close to 2.

Write the equation for the horizontal asymptote.

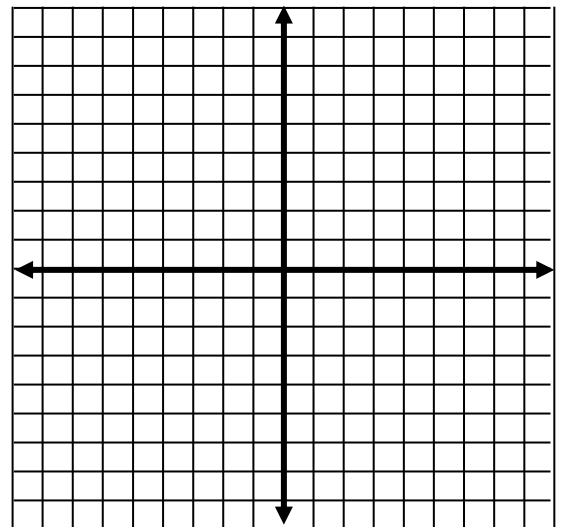
Do you need to factor the denominator?
Set the denominator equal to zero and solve.

These x values are the vertical asymptotes.
Write the equation for the vertical asymptotes.

Sketch a graph of the function.

Domain:

Range:



2. Enter $\frac{(x-4)}{x^2+3x-10}$ into y_1 .

B
O
B
O

Complete the table below.

X	Y ₁
50	
75	
100	
200	
300	

What number does the y_1 get very close to?



This number is the horizontal asymptote. As x gets bigger, the y value approaches or gets very close to 0.

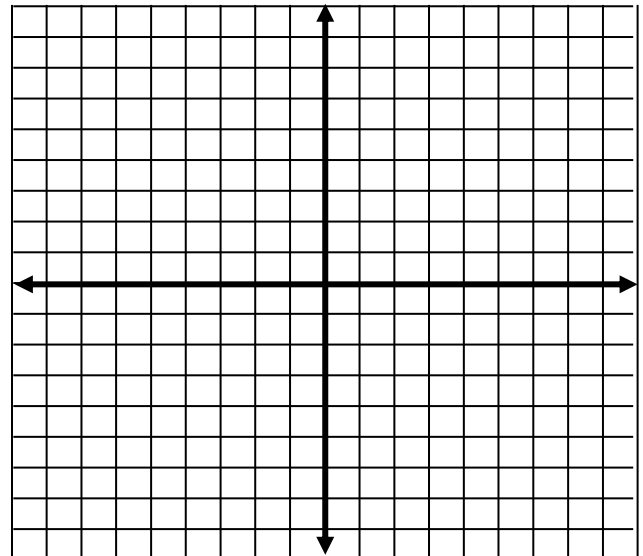
Write the equation for the horizontal asymptote.

Now factor the denominator.
Set each factor equal to zero and solve.

These x values are the vertical asymptotes.
Write the equation for the vertical asymptotes.

Sketch the graph of the function.

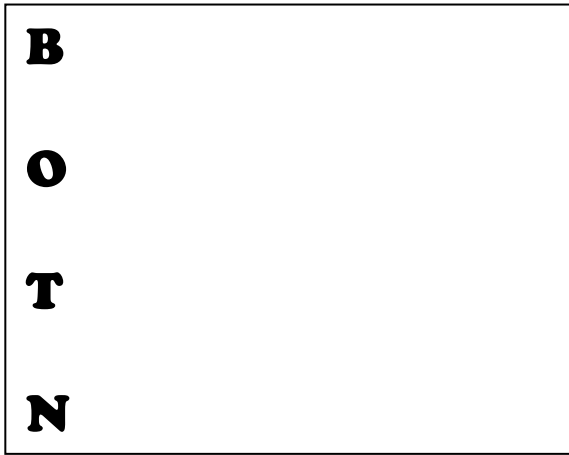
Domain:



3. Enter $\frac{2x^2+6x}{x-2}$ into y_1 .

Complete the table below.

X	Y_1
50	
75	
100	
200	
300	



What number does the y_1 get very close to?

In this case, there is no horizontal asymptote. As x gets bigger, the y value just keeps getting bigger.

Do you need to factor the denominator?
Set the denominator equal to zero and solve.

These x values are the vertical asymptotes. Write the equation for the vertical asymptotes.

Quick Review Questions:

What do COCO, BOBO & BOTN help you find?

How do you find vertical asymptotes?

Practice Problems

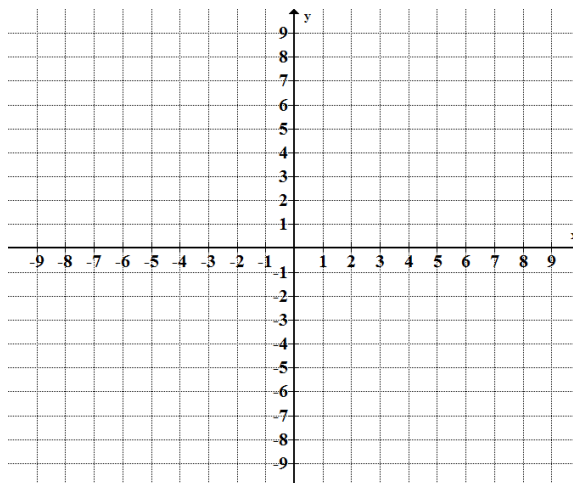
Given the following rational functions, find the vertical and horizontal asymptotes, domain and range in interval & set notations, and graph.

1. $y = \frac{1}{x+4} + 3$

VA: _____ HA: _____

Domain

Range

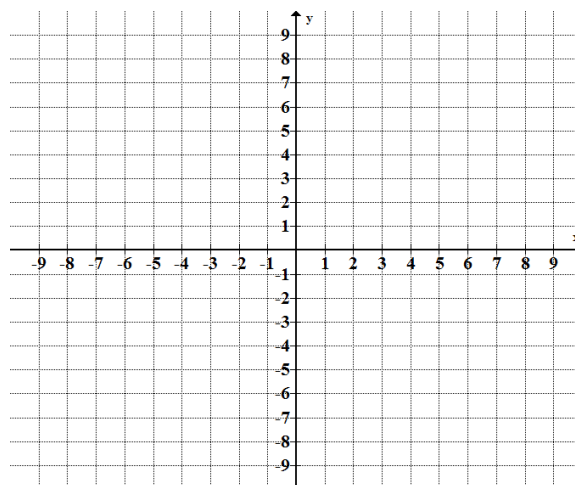


2. $y = \frac{4x+3}{x-2}$

VA: _____ HA: _____

Domain

Range

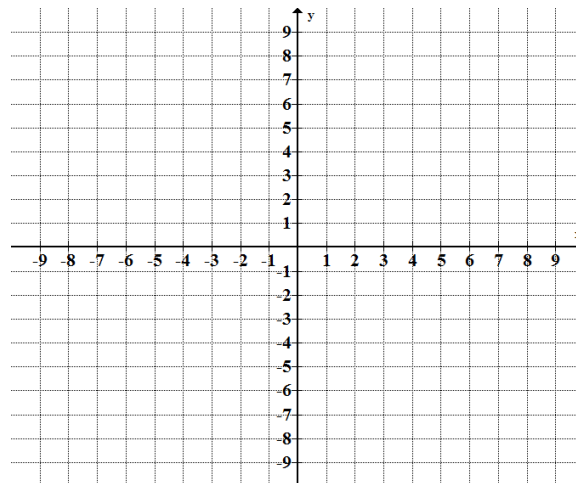


3. $y = \frac{1}{x^2+2x-8}$

VA: _____ HA: _____

Domain

Range



4. $y = \frac{x^2+3x+2}{x+4}$

VA: _____ HA: _____