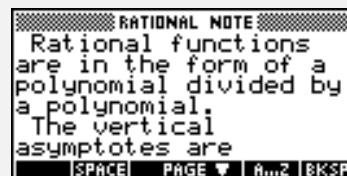


**Objectives:**

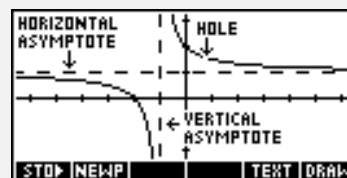
Using the **RATIONAL** applet, the student will investigate rational functions and the asymptotes associated with the function.

**Functionality:**

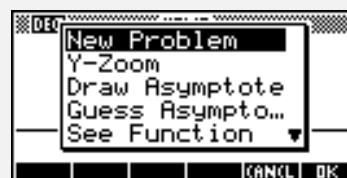
When the student presses **START**, the **RATIONAL NOTE** is displayed.



After reading the note, the student should look at the **SKETCH** for further explanation.



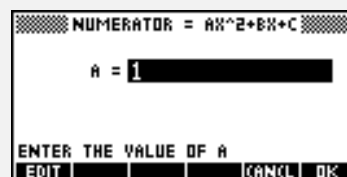
**VIEWS** allows the student to enter a new problem, zoom in the y direction, draw asymptotes, enter the asymptotes, or view the function.



**New Problem** allows the student to enter a rational function or have the calculator create one.



**Enter Your Own** prompts the student to enter the values of the coefficients and constants for the numerator and the denominator.



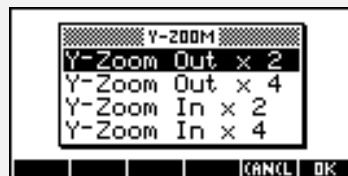
When the student has finished entering the coefficients and constants, the rational expression will be displayed. If the student had chosen **Calc Create**, a rational expression will be created and displayed.

$$\frac{(X^2+X-2)}{X^2-1}$$

Pressing any key will then plot the rational function.



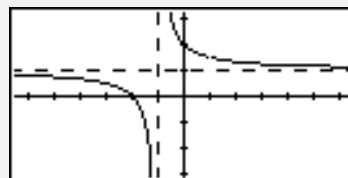
If a complete graph is not showing, **Y-Zoom** will zoom in or out vertically by a factor of 2 or 4.



**Draw Asymptote** allows the student to choose which asymptote will be drawn in on the graph.



The asymptotes will be displayed on the graph of the rational function. They will not be cleared until a new function is plotted.



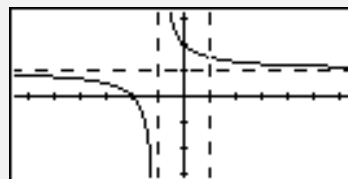
**Guess Asymptote** allows the student to choose which asymptote equation will be entered.



The student will then be prompted for an equation for the asymptote. If correct, a message box will display **GREAT JOB!** If incorrect, **TRY AGAIN!** will be displayed.



Immediately following the message box, the graph of the rational function will be displayed along with the student's asymptote.



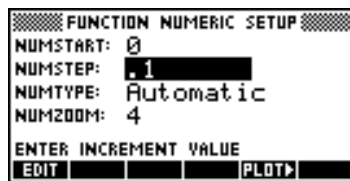
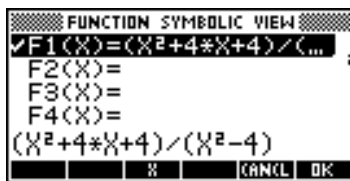
**See Function** will display the rational expression again if needed.

$$\frac{(X^2+X-2)}{X^2-1}$$

### ***Additional Exploration:***

Find the domain for a function using the Numeric view. Using the **Function** applet, have students enter a function in F1(X). Use the up and down arrows in the numeric view to analyze the defined x and y values:

Find the domain of  $f(x) = \frac{x^2 + 4x + 4}{x^2 - 4}$



X	F1		
1.8	-19		
1.9	-39		
2.0	UNDEF.		
2.1	41		
2.2	21		
2.3	14.33333		
$(X^2+4*X+4)/(X^2-4)$			
ZOOM		BIG	DEF

Ideas can be applied to:

Algebra II, Precalculus, Calculus

Programs associated with this applet:

.RAT.GR, .RAT.NP, .RAT.ST, .RAT.YZ, .RAT.GUH, .RAT.COM,  
 .RAT.GUV, .RAT.GU, .RAT.SF, .RAT.GRH, .RAT.GRV, .RAT.NPO,  
 .RAT.NPC, .RAT.SV