

Objectives:

Using the **BASIC FUNCTIONS** applet, the student will be able to explore stretches, shrinks, and translations of seven basic functions.

Functionality:

When the student selects **START**, the **BASIC FUNCTIONS NOTE** will be displayed.

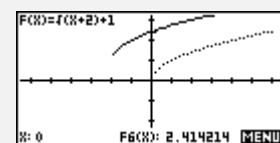
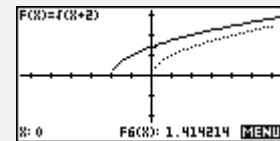
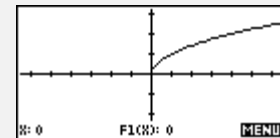
The student should then press **VIEWS** will to choose a basic function to be explored, to enter a value for A, H or K to see each parameter's effect on the basic graphs. The basic form is: $f(x) = A \cdot f(x - H) + K$.

Basic f(x) allows choice from one of seven basic functions:
 $y=x$, $y=x^2$, $y=x^3$, $y=|x|$, $y=\sqrt{x}$, $y=1/x$, $y=1/x^2$.

When one of the basic graphs is chosen, the dotted plot of the curve appears on a blank screen and then is plotted on the axes. Return to **VIEWS** to input values for A, H or K.

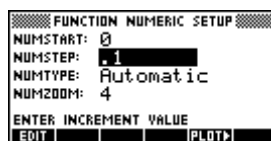
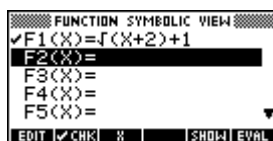
Selecting **Enter A**, **Enter H**, or **Enter K** displays the equation of the current function and prompts for a value. After entering **OK**, the function and its changes are plotted with the expression for the "new" function also displayed.

Until you **Reset A,H,K**, or choose a different basic function, the changes continue to be updated as seen in the example to the right. The default values are $A = 1$, $H = 0$ and $K = 0$.



Additional Exploration:

Use Function to explore the domain and/or range using the **NUM** view. Enter a function in F1(X) & use the up/down arrows in **NUM** to analyze the defined x and y values: Eg. Find the domain and range of $y = \sqrt{x+2} + 1$.



X	F1		
-2.0	UNDEF.		
-1.5	UNDEF.		
-1.0	1		
-0.5	1.316228		
0.0	1.414214		
$\sqrt{x+2}+1$			
ZOOM BIG DEF			

Programs associated with this applet:

.BF.S, .BF.R, .BF.K, .BF.H, .BF.A, .BF.C, .BF.SV

Basic Functions

$A f(x - H) + K$

Name _____

Date _____

Directions: Choose the **BASIC FUNCTIONS** applet. Press **START** . Once you have read the note, press **VIEWS** to make your next choice. Complete the table with the information you obtain from each given function.

Function	Basic f(x)	A	H	K	Translation	Sketch
1. $f(x) = \sqrt{x+2} - 1$						
2. $f(x) = \frac{1}{2}(x-3)^2 + 2$						
3. $f(x) = \frac{2}{x-1} - 3$						
4. $f(x) = \frac{-2}{x^2 + 1} + 1$						
5. $f(x) = \frac{1}{5}(x+4)^2 - 3$						
6. $f(x) = -3 x+2 -1$						