Graphing Techniques

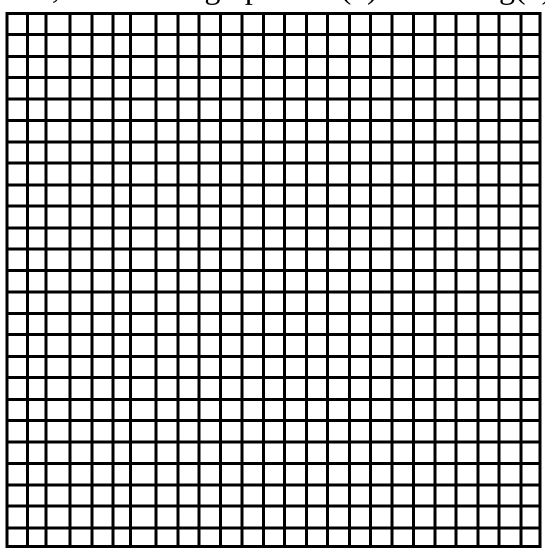
Names:____

About this Laboratory

Many graphs may be created from the graphs of elementary functions. In this laboratory, we will explore new graphs by translating and magnifying familiar graphs.

CP 1

A) On the same set of axes, sketch the graph for $f(x) = x^2$ and $g(x) = x^2+2$.



B) Fill in a table of values for x, f(x), and g(x) when x is an integer in the interval [-5, 5].

To do this select the radio button next to **x table entries by hand**. After entering the x-value into the table, press **Enter**.

f(x)											
g(x)											
x	-5	-4	-3	-2	-1	0	1	2	3	4	5

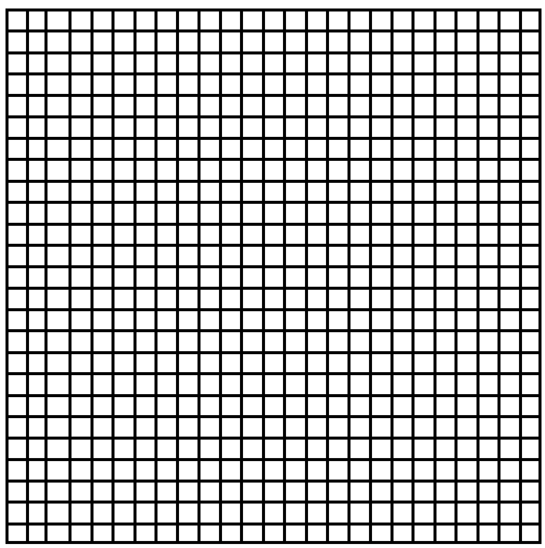
C) Discuss the change between the functions graphically.

D) Give a simple pattern found in the columns of the table comparing f(x) and g(x).

CP2*

Enter the function to graph f(x) = sqrt(x).

A) On the same set of axes, sketch and label f(x), g(x) = f(x)+1, h(x) = f(x)-1, and k(x) = f(x)+2. (Clearly indicate each function.) You may use the *Grapher* to find the graph of one function at a time.



B) What is the domain and range for each of these functions?

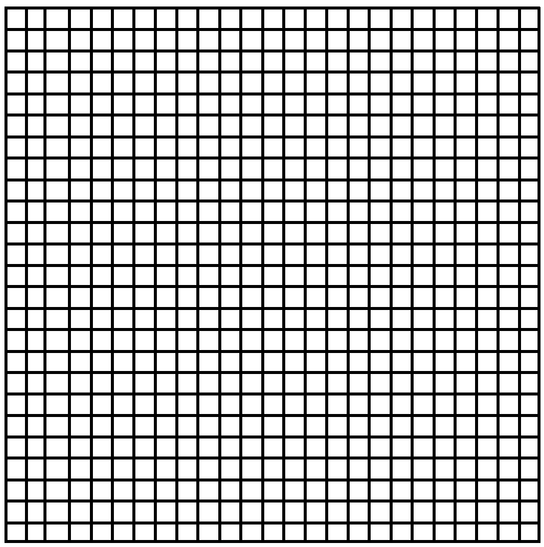
f(x) D_f:____________ R_f:________
g(x) D_g:____________ R_g:________
h(x) D_h:____________ R_h:________
k(x) D_k:___________ R_k:________

Now explore various graphs and tables of functions. Generalize completely with specifics what happens graphically when g(x) = f(x)+c.

CP 3
Select **Graph f(x)**.
Select **Translate f(x)**.
g(x) = ___________________(This is f(x) translated.)

CP 4
Enter the function to graph $f(x) = x^2$.
Select **Graph**.
Use the scroll bar to let c take on the needed value, for example first let c = 2.

A) Sketch $f(x) = x^2$ and $g(x) = (x+2)^2$ on the same set of axes.



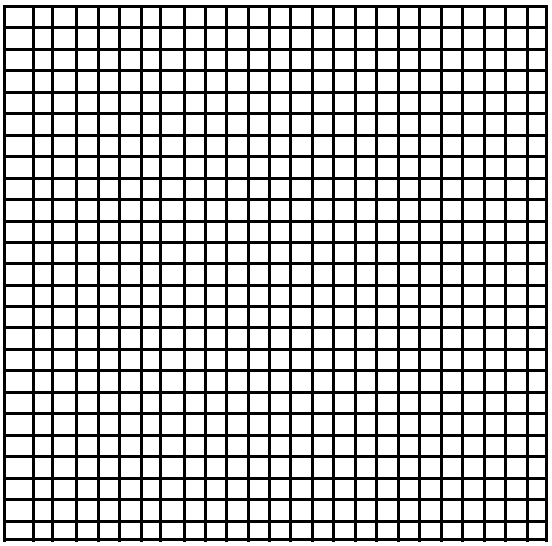
B) Fill in the table of values for x, f(x), and g(x) when x is an integer in the interval [-5, 5].
(Hint: It will help you answer part D below.)

g(x)	9										
f(x)	25										
x	-5	-4	-3	-2	-1	0	1	2	3	4	5

C) Discuss the change between the functions graphically.

D) Give a pattern found in the rows and columns of the table that helps explain the graphical change in part C.

E) Sketch f(x) = sqrt (x) and g(x) = sqrt(x-2) on the same set of axes.
(Clearly indicate each function.)



F) What is the domain and range of each function?

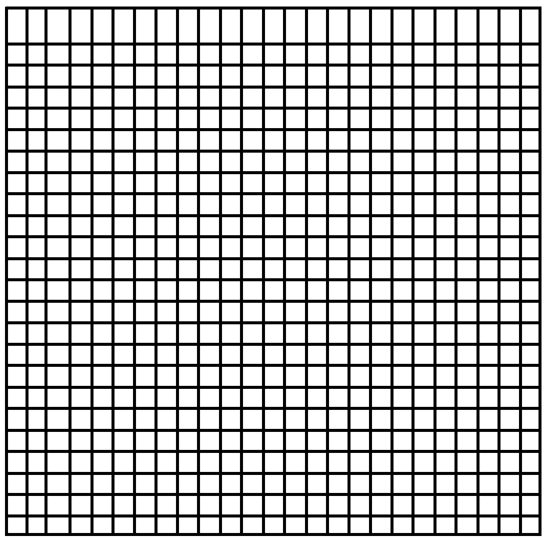
f(x) $\boldsymbol{D_f}$**:**_____ $\boldsymbol{R_f}$**:**_____

g(x) $\boldsymbol{D_g}$**:**_____ $\boldsymbol{R_g}$**:**_____

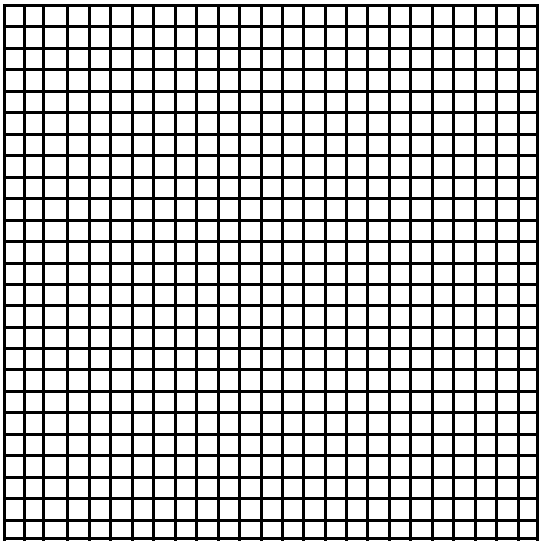
CP 5
Enter the function to graph $f(x) = x^2$.
Select **Graph**.
Use the scroll bars to let b and c take on the needed values.

Sketch a graph of $g(x) = (x-2)^2+3$.

What are the coordinates of the vertex?



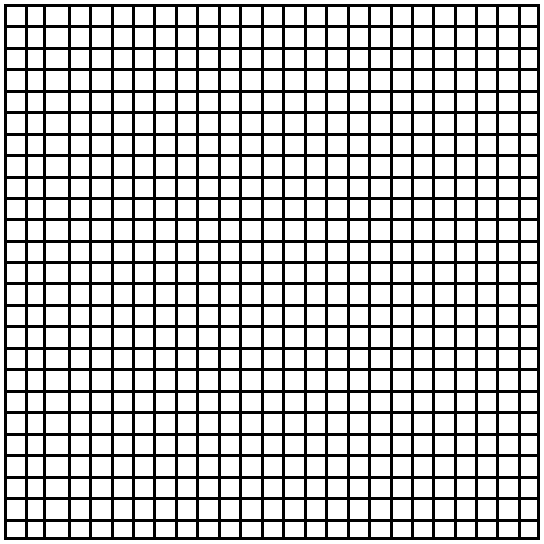
CP 6*
Enter the function to graph $f(x) = x^2$.
Select **Graph**.
On the same set of axes sketch and label $f(x) = x^2$, $g(x) = 2x^2$ and $h(x) = .4\ x^2$. You may use the *Grapher* to find the graph of one function at a time.



Describe how f(x) changes when "a" is negative for g(x) = af(x). (Explore more than one function before you make a conjecture. Be as accurate as possible with your description. More than one type of change may take place.)

Now enter the function to graph $f(x) = x^3$.

A) On the same set of axes, sketch the graph for $f(x) = x^3$ and $g(x) = 3.5x^3$.



B) Fill in a table of values for x, f(x) and g(x) when x is an integer in the interval [-5, 5].

g(x)	-375										
f(x)	-125										
x	-5	-4	-3	-2	-1	0	1	2	3	4	5

C) Discuss the change between the functions graphically.

D) Give a simple pattern found in the columns of the table comparing f(x) and g(x).

CP 7

One at a time select each of the 5 functions listed under **Pick one!** and enter an equation for each.

1. f(x) = __________________

2. f(x) = __________________

3. f(x) = __________________

4. f(x) = __________________

5. f(x) = __________________