

Exploration 2: Left and Right Choose any function, for example, x^2 . Using different numbers, substitute $(x+\text{number})$ or $(x-\text{number})$ for x in the function formula. Graph several such functions on the same picture, for example, x^2 , $(x-1)^2$, $(x+4)^2$. What happens? Why? Try it with several different functions. What is different? What is the same?

Exploration 3: Stretch-1 Choose any function, for example, x^2 . On the same picture, graph the original function and the function multiplied by different numbers, for example, $3(x^2)$, $-5(x^2)$, $.7(x^2)$, and so on. What do you see? Why does it happen? Try it with several different functions. What is different? What is the same?

Exploration 4: Stretch-2 Choose any function, for example, x^2 . Using different numbers, substitute $(x*\text{number})$ for x in the function formula. Graph several such functions on the same picture, for example, $(x*3)^2$, $(x*5)^2$, $(x*.1)^2$. What do you see? Why does it happen? Try it with several different functions. What is different? What is the same?

Exploration 5: Combine! Choose a function, for example, x^2 , and do all or some of the things from the above to it, for example, $(2x+3)^2-5$. First graph only the original function and try to predict how the modified function will look like. Then graph both the original and the modified function on the same picture, and see if you predicted the shape correctly. Try to do modifications in a different order (e.g., $2x+3)^2-5$ and $(2(x+3))^2-5$). Does it make a difference? Why? Now do it for several different functions.