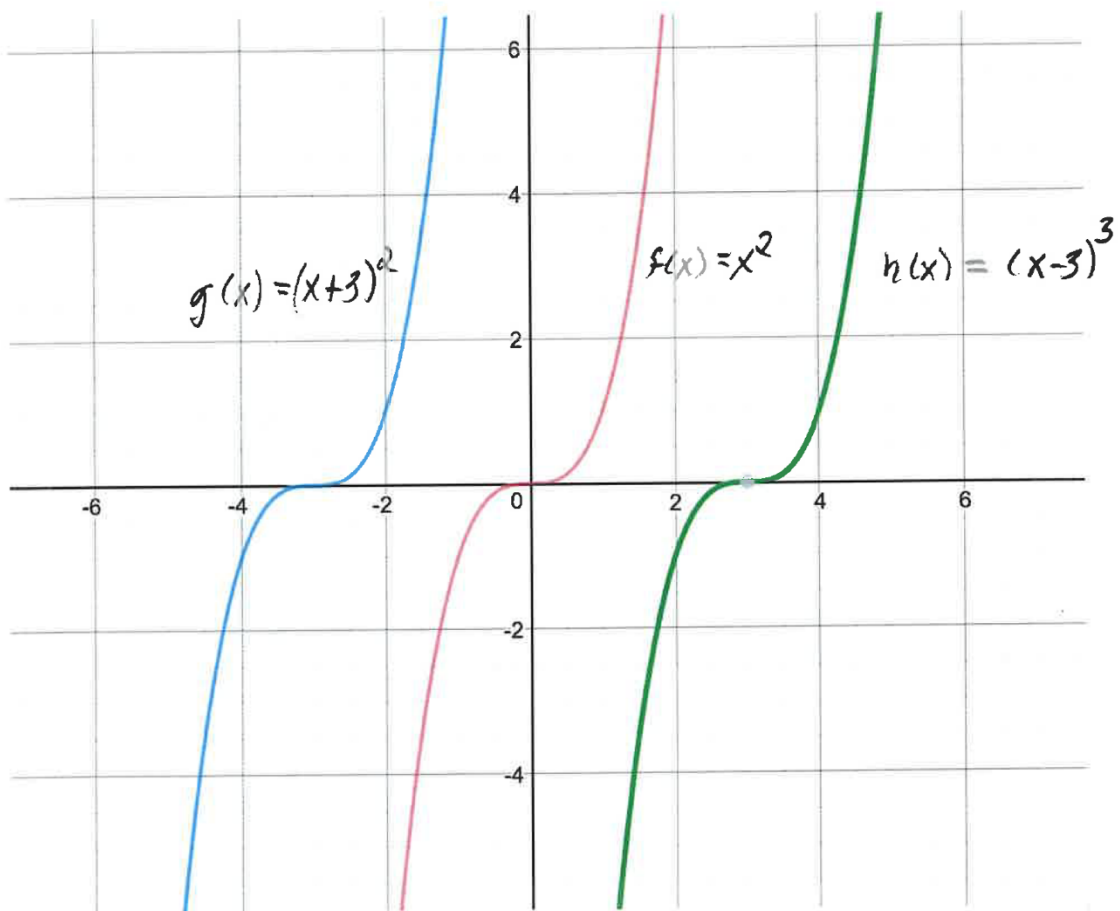


Transformations of Functions: (*Part 1*)

Horizontal Shifts:

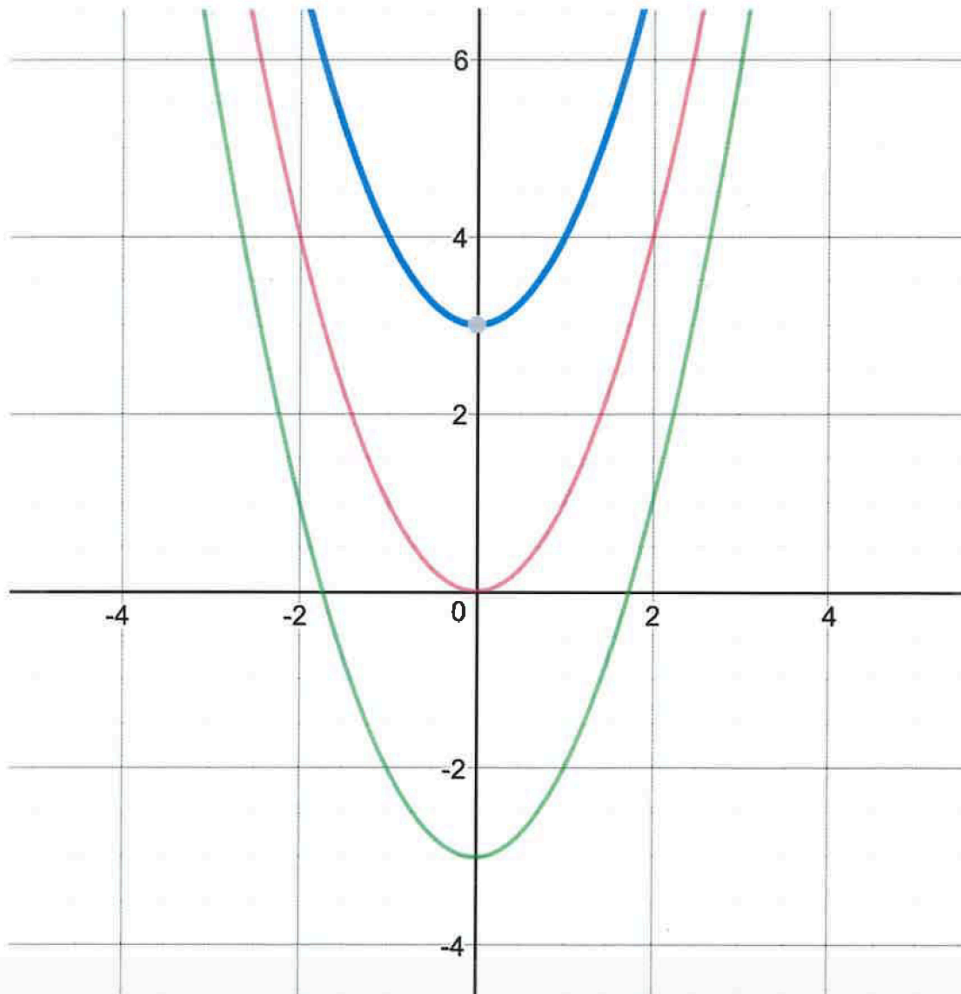
If $g(x) = f(x + h)$ then the graph of g can be obtained by shifting the graph of f to the left by h units. (subtract h from every x -coordinate of the graph of f).



Vertical Shifts:

If $g(x) = f(x) + k$ then the graph of g can be obtained by shifting the graph of f up by k units. (Add k to every y -coordinate of the graph of f)

If $g(x) = f(x) - k$ then the graph of g can be obtained by shifting the graph of f down by c units. (Subtract k from every y -coordinate of the graph of f)



Stretching and Compressing:

Let a be a positive real number

If $g(x) = af(x)$ then the graph of g can be obtained by *stretching* the graph of f vertically if $a > 1$. (Multiply every y -coordinate of the graph of f by a)

If $g(x) = af(x)$ then the graph of g can be obtained by *compressing* the graph of f vertically if $0 < a < 1$. (Multiply every y -coordinate of the graph of f by a)

