Math 1410: Worksheet 3

September 3, 2021

- 1. Consider the function $f(x) = x^2$.
 - (a) Write an expression for the function whose graph is the graph of f(x) translated downward by 4 and rightward by 2.
 - (b) Write an expression for the function whose graph is the graph of f(x) stretched vertically by a factor of 3 and then translated leftward by 3.
 - (c) What geometric transformations are applied to the graph of f(x) to get the graph of $g(x) = -(x-1)^2 + 2$?
 - (d) What geometric transformations are applied to the graph of f(x) to get the graph of $h(x) = 3(x+1)^2 1$?

- 2. Consider the quadratic function $f(x) = -x^2 2x 4$.
 - (a) Write this function in the form $f(x) = a(x h)^2 + k$.
 - (b) Use this rewritten form to determine the vertex of f(x).
 - (c) Use this rewritten form to sketch a graph of f(x).
 - (d) Use this rewritten form to determine the domain and range of f(x), and where f(x) is increasing or decreasing.