Section 2.5 Transformations of Functions

Vertical Shifts

Let **f** be a function and **c** a positive real number,

- The graph of y = f(x) + c is the graph of y = f(x) shifted **c** units vertically upward.
  - Draw the graph of f and ***raise the graph of f by c units.***
  - Changes in the equation y = f(x): **c** is added to f(x).
- The graph of y = f(x) – c is the graph of y = f(x) shifted **c** units vertically downward.
  - Draw the graph of f and ***lower the graph of f by c units.***
  - Changes in the equation y = f(x): **c** is subtracted from f(x).

Example 1: Use the graph of f(x) = $|x|$ to obtain the graph of g(x) = $|x| - 3$ and h(x) = $|x| + 3$.