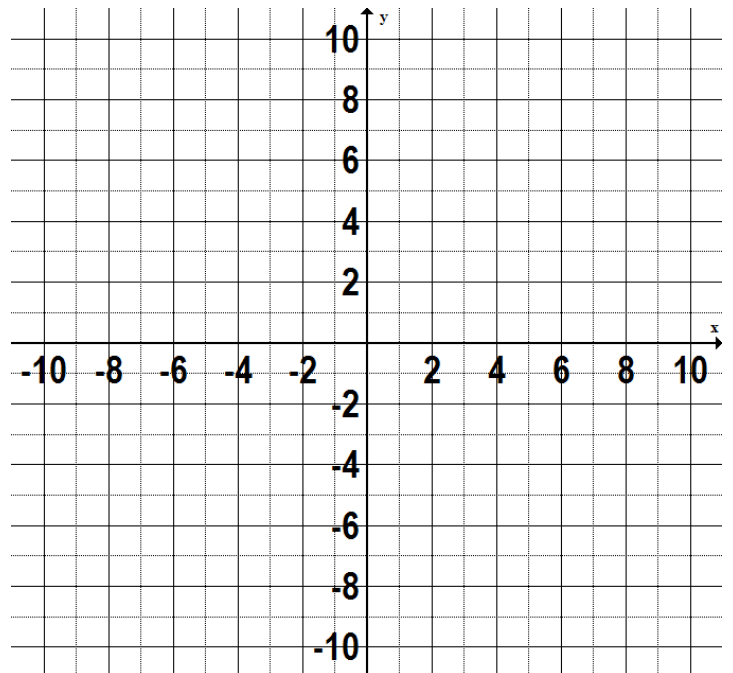# Introduction to Functions – Review

When we are dealing with transformations, we need our functions in the form;
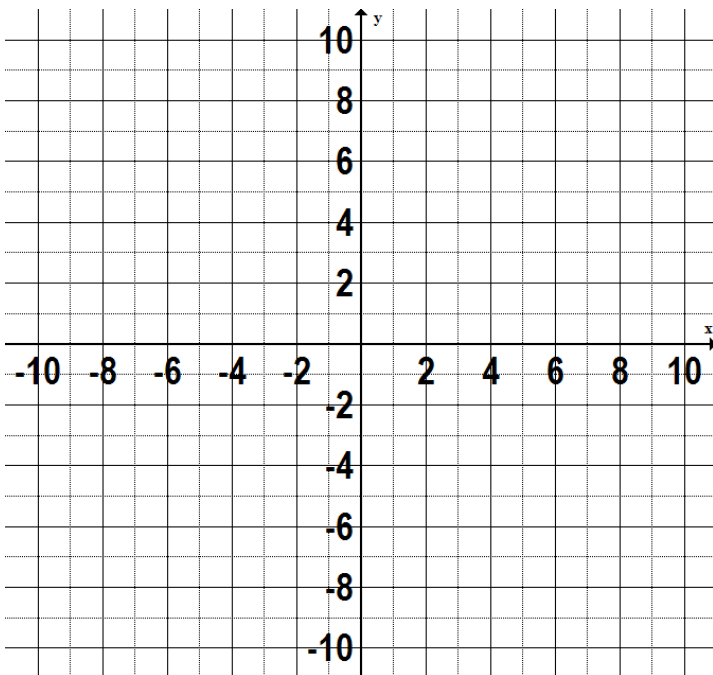
$$g(x) = af[k(x - d)] + x$$

1. For $f(x) = |x|$,
   a. Graph $f(x)$ on the grid below.
   b. Determine the domain and range of $f(x)$.
   c. List the transformations that must be applied to $f(x)$, to obtain $g(x) = -2f(-2x - 8) + 7$.
   d. Graph $g(x)$ on the grid below.
   e. Determine the domain and range of $g(x)$.
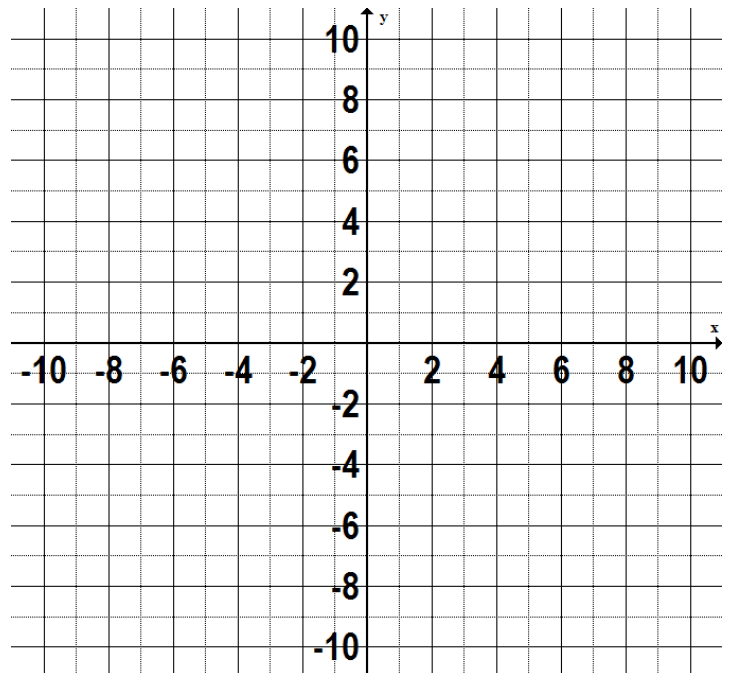   f. Determine the value of $f(-3) + g(-5)$.

2. For $f(x) = x^2$,
   a. Graph $f(x)$ on the grid below.
   b. Determine the domain and range of $f(x)$.
   c. List the transformations that must be applied to $f(x)$, to obtain $g(x) = -f(4x + 8)$.
   d. Graph g(x) on the grid below.
   e. Determine the domain and range of $g(x)$.
   f. Determine the equation of $g^{-1}(x)$.
   g. Graph $g^{-1}(x)$ on the grid below.

3. For $f(x) = \sqrt{x}$,

    a. Graph $f(x)$ on the grid below.

    b. Determine the domain and range of $f(x)$.

    c. List the transformations that must be applied to $f(x)$, to obtain $g(x) = -f(-3x + 3) + 4$.

    d. Graph $g(x)$ on the grid below.

    e. Determine the domain and range of $g(x)$.

    f. Determine the value of $g(-2) - f(4)$.

    g. Determine the equation of $g^{-1}(x)$.

    h. Graph $g^{-1}(x)$ on the grid below.

4. For $f(x) = x^2$,
   a. Graph $f(x)$ on the grid below.
   b. Determine the domain and range of $f(x)$.
   c. List the transformations that must be applied to $f(x)$, to obtain $g(x) = f(3 - x) + 3$.
   d. Graph g(x) on the grid below.
   e. Determine the domain and range of $g(x)$.
   f. Determine and list any invariant points on your graph.
   g. Determine the equation of $g^{-1}(x)$.
   h. Graph $g^{-1}(x)$ on the grid below.
   i. Determine the value of $f(2) - g(2)$.