§ 4.6 Transformations of Exponential Functions

Let us start with the parent function $f(x) = 2^x$. We will now look at transformations using the function:

$$g(x) = af(k(x-d))+c$$

where f is the function, a,k,d, and c are variables which change the location or shape of the graph f(x).

We will now investigate these variables in terms of $f(x) = b^x$.

For now, we will let b = 2. Let's refer to GSP to see what a, k, d and c do. Since the function is an exponential, the above function will appear as:

$$g(x) = ab^{(k(x-d))}+c$$

Notes about: $g(x) = ab^{(k(x-d))}+c$

You will notice that if g(x) has only an "a" and/or "k" and/or d transformation(s), the asymptote is the same as the parent function located at f(x)=0.

"c" transformations raise or lower the parent's asymptote "c" units.

The domain of the function, regardless of the transformation(s) is ALWAYS {xεR}.

The range is only affected by "c" transformations. In essence, the range can be written as {f(x)εR|f(x)<c} or {f(x)εR|f(x)>c}, depending on "k".

Homework:§4.6#1-3,5,7-9,11