MATH 125 College Algebra OpenStax Name:_____Section_____

Section 6.2 Graphs of Exponential Functions Professor _____

TRANSLATIONS OF EXPONENTIAL FUNCTIONS

A translation of an exponential function has the form

$$f(x) = ab^{x+c} + d$$

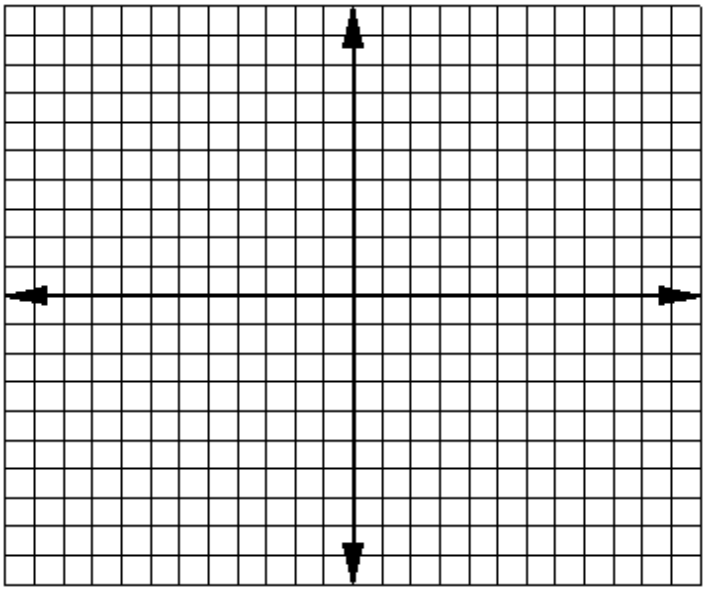
Where the parent function, $y = b^x, b > 1$,is

- shifted horizontally c units to the left.
- stretched vertically by a factor of $|a|$ if $|a| > 0$.
- compressed vertically by a factor of $|a|$ if $0 < |a| < 1$.
- shifted vertically d units.
- reflected about the x-axis when $a < 0$.

Note the order of the shifts, transformations, and reflections follow the order of operations.

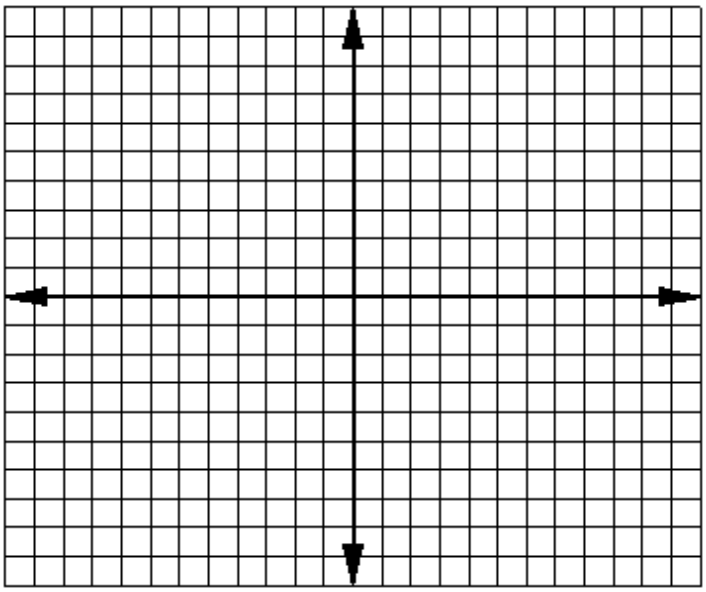
1. $y = 2^x$

x	y



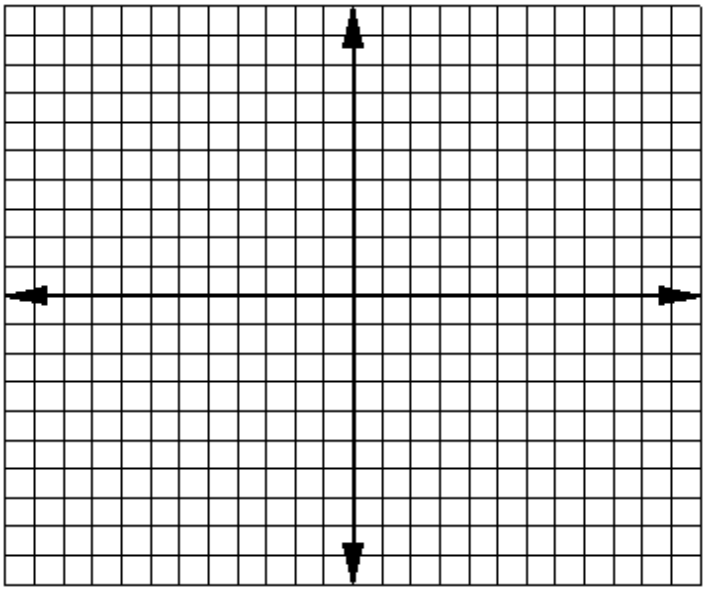
2. $y = 2^{-x}$

x	y



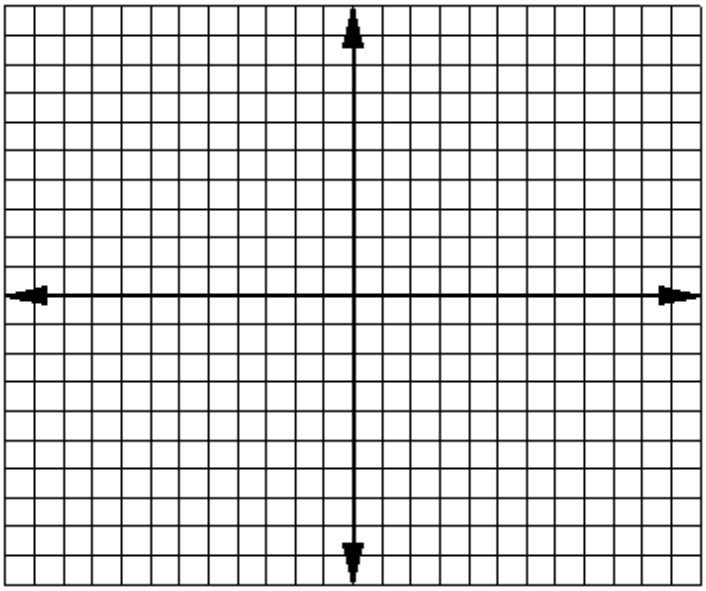
3. $y = -2^x$

x	y



4. $y = 3(2)^{x+1}$

x	y



5. $y = 3(2)^{x-4} - 5$

x	y