

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Standard Form of an Exponential Function

$$y = a(b)^{(x-h)} + k$$

Notation	Type of Transformation	Change to Graph
<b>a</b>	Reflection $\longrightarrow$ Stretch $\longrightarrow$ Shrink $\longrightarrow$	$\longrightarrow -a$ "flip" $\longrightarrow a > 1$ "tall" $\longrightarrow 0 < a < 1$ "short"
<b>b</b>	Base	$b > 1$ Growth $0 < b < 1$ Decay
<b>h</b>	Left or Right	$-h$ Right $+h$ Left
<b>k</b>	up or down	$+k$ up $-k$ down

*\*Asymptote*

Examples:

Describe the transformations of the parent graph for each equation.

1.  $f(x) = 2^x + 7$

$\uparrow$  parent growth  
 $\uparrow$  UP Asymptote

2.  $f(x) = -(3)^{x+5} - 2$

$\uparrow$  parent growth  
 Reflect  $\leftarrow$   
 $\leftarrow$  Left  
 Down Asym.

3.  $f(x) = 2\left(\frac{1}{2}\right)^{x-3} + 12$

$\uparrow$  parent decay  
 $\leftarrow$  Right  
 stretch  $\leftarrow$   
 UP Asym.