

7-1 Exponential functions in the form of:  $y = b^x$

Team	Has an increasing graph	Has a decreasing graph
1	$y = 4^x$	$y = 0.6^x$
2	$y = 2^x$	$y = 0.3^x$
3	$y = 1.5^x$	$y = (\frac{2}{3})^x$
4	$y = 100^x$	$y = (\frac{3}{4})^x$
5		
6		
7		
8		
9		

7-4 Describe how the value of  $b$  effects the shape of the graph in each of the cases below. Make a t-chart and rough sketch of a graph for each situation. Describe the basic shape of the graphs, including asymptotes, symmetry, what happens as  $x$  gets larger or smaller, or other aspects that seem unique or important.

Description	T-chart	Sketch of Graph												
$b > 1$ graph is increasing as $x$ increases, $y$ also increases	<table border="1"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td><math>\frac{1}{4}</math></td> <td><math>\frac{1}{2}</math></td> <td>1</td> <td>2</td> <td>4</td> </tr> </table>	x	-2	-1	0	1	2	y	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	
x	-2	-1	0	1	2									
y	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4									
$0 < b < 1$ graph is decreasing as $x$ increases, $y$ decreases	<table border="1"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td>4</td> <td>2</td> <td>1</td> <td><math>\frac{1}{2}</math></td> <td><math>\frac{1}{4}</math></td> </tr> </table>	x	-2	-1	0	1	2	y	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	
x	-2	-1	0	1	2									
y	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$									
$b = 1$ horizontal line @ $y = 1$	<table border="1"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </table>	x	-2	-1	0	1	2	y	1	1	1	1	1	
x	-2	-1	0	1	2									
y	1	1	1	1	1									
$b = 0$ if $x = -1$ ; $y = 0^{-1} = \frac{1}{0}$ undefined $0^0 \neq 1$	<table border="1"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td><math>\frac{1}{3}</math></td> <td><math>\frac{1}{3}</math></td> <td><math>\frac{1}{3}</math></td> <td>0</td> <td>0</td> </tr> </table>	x	-2	-1	0	1	2	y	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	0	0	
x	-2	-1	0	1	2									
y	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	0	0									

$y = 2^x$

$y = (\frac{1}{2})^x$

$y = 1^x$

$y = 0^x$

Were there aspects of the graphs for each situation that did not change? All have  $(0, 1)$  as y-int.

- All stay in Quadrant 1+2
- First 2 graphs have asymptotes @