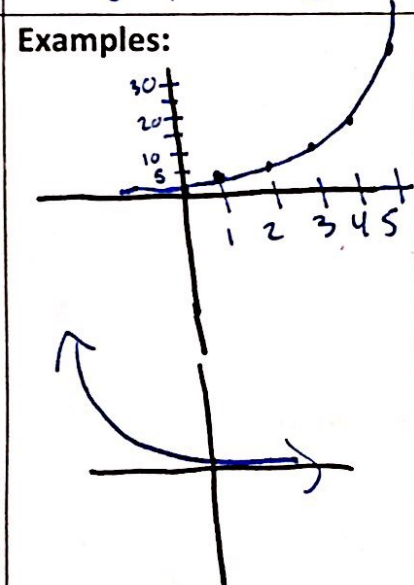
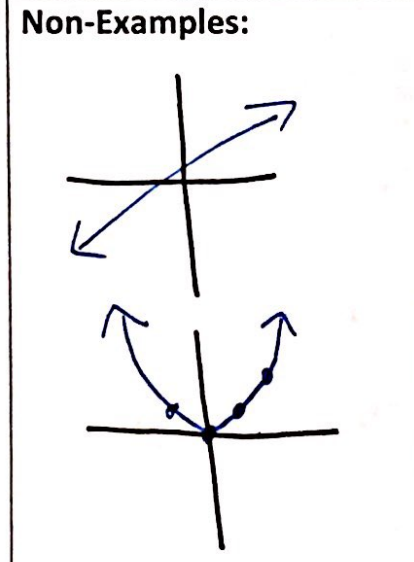


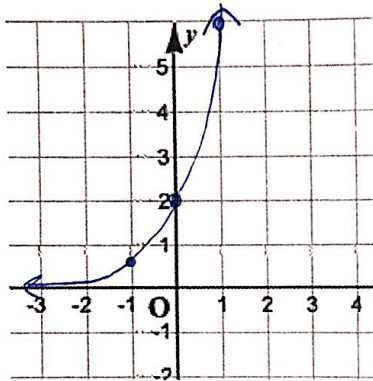
6-4a Exponential Functions

ALGEBRAICALLY (equation)	GRAPHICALLY (graph)	NUMERICALLY (table)																				
<p>Can be written in the form:</p> $y = a \cdot b^x$	<p><u>L-shaped</u> increases or decreases very quickly</p>	<p>x changes by a constant amount y changes by multiplying (r)</p>																				
<p>Examples:</p> $y = 2^x$ $y = 5 \cdot 3^x$ <p>* x is the exponent</p>	<p>Examples:</p> 	<p>Examples:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>-1</td><td>1/2</td></tr> <tr><td>0</td><td>1</td></tr> <tr><td>1</td><td>2</td></tr> <tr><td>2</td><td>4</td></tr> </tbody> </table> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>-1</td><td>3</td></tr> <tr><td>0</td><td>1</td></tr> <tr><td>1</td><td>1/3</td></tr> <tr><td>2</td><td>1/9</td></tr> </tbody> </table>	x	y	-1	1/2	0	1	1	2	2	4	x	y	-1	3	0	1	1	1/3	2	1/9
x	y																					
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<p>Non-Examples:</p> $y = x^2$ $y = 3x$	<p>Non-Examples:</p> 	<p>Non-Examples:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>-1</td><td>-2</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>2</td></tr> <tr><td>2</td><td>4</td></tr> </tbody> </table> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>-1</td></tr> <tr><td>2</td><td>4</td></tr> </tbody> </table>	x	y	-1	-2	0	0	1	2	2	4	x	y	-1	1	0	0	1	-1	2	4
x	y																					
-1	-2																					
0	0																					
1	2																					
2	4																					
x	y																					
-1	1																					
0	0																					
1	-1																					
2	4																					

$$f(x) = 2 \cdot 3^x$$

$$1. y = 2 \cdot 3^x$$

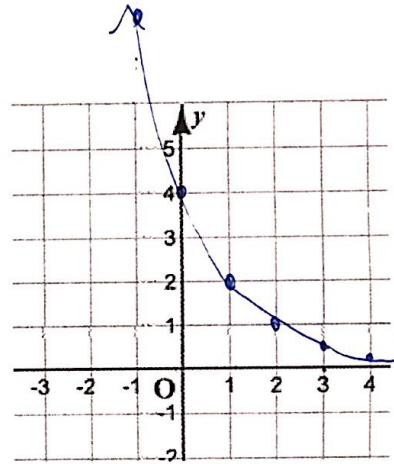
x	$2 \cdot 3^x$	y
-1	$2 \cdot 3^{-1} = 2 \cdot \frac{1}{3} = \frac{2}{3}$	$\frac{2}{3}$
0	$2 \cdot 3^0 = 2 \cdot 1 = 2$	2
1	$2 \cdot 3^1 = 2 \cdot 3 = 6$	6
2	$2 \cdot 3^2 = 2 \cdot 9 = 18$	18



GRAPHING EXPONENTIAL FUNCTIONS

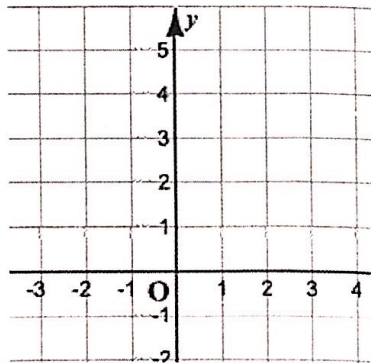
$$2. y = 4 \cdot \left(\frac{1}{2}\right)^x$$

x	$4 \cdot \left(\frac{1}{2}\right)^x$	y
-1	$4 \cdot \left(\frac{1}{2}\right)^{-1} = 4 \cdot 2 = 8$	8
0	$4 \cdot \left(\frac{1}{2}\right)^0 = 4 \cdot 1 = 4$	4
1	$4 \cdot \left(\frac{1}{2}\right)^1 = 4 \cdot \frac{1}{2} = 2$	2
2	$4 \cdot \left(\frac{1}{2}\right)^2 = 4 \cdot \left(\frac{1}{4}\right) = 1$	1



$$3. y = 3 \cdot 2^x$$

x	$3 \cdot 2^x$	y
-1		$\frac{3}{2}$
0		3
1		6
2		12



$$4. y = 3 \cdot \left(\frac{1}{3}\right)^x$$

x		y
-1		9
0		3
1		1
2		$\frac{1}{3}$

