

Graphing Exponential Equations

P. 24

1.  $y = 3^x - 4$

PARENT:  $y = 3^x$

Shifts:

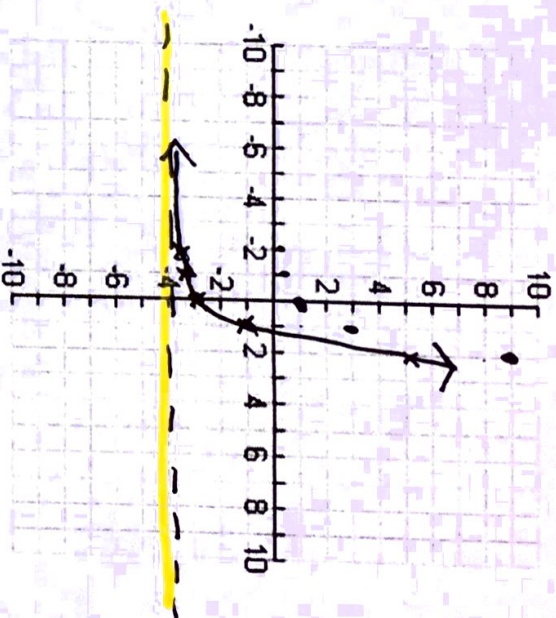
down 4

$x$	$y = 3^x$
-2	$1/9$
-1	$1/3$
0	1
1	3
2	9

Domain:  $\{x | x = \mathbb{R}\}$

Range:  $\{y | y > -4\}$

Asymptote:  $y = -4$



2.  $2 \cdot 2^{x+3} - 4$

PARENT:  $y = 2^x$

Shifts:

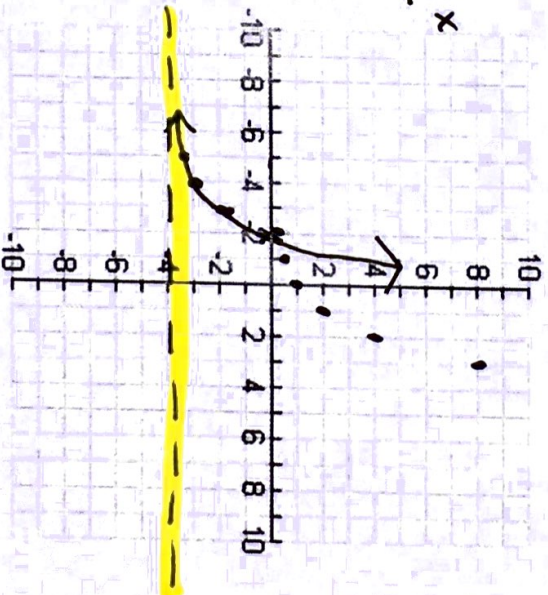
vertical stretch by 2  
left 3  
down 4

Domain:  $\{x | x = \mathbb{R}\}$

Range:  $\{y | y > -4\}$

Asymptote:  $y = -4$

$x$	$y = 2^x$
-2	$1/4$
-1	$1/2$
0	1
1	2
2	4
3	8



3.  $y = -3^{x-1} + 1$

PARENT:  $y = 3^x$

Shifts:

reflect over x-axis  
right 1  
up 1

Domain:

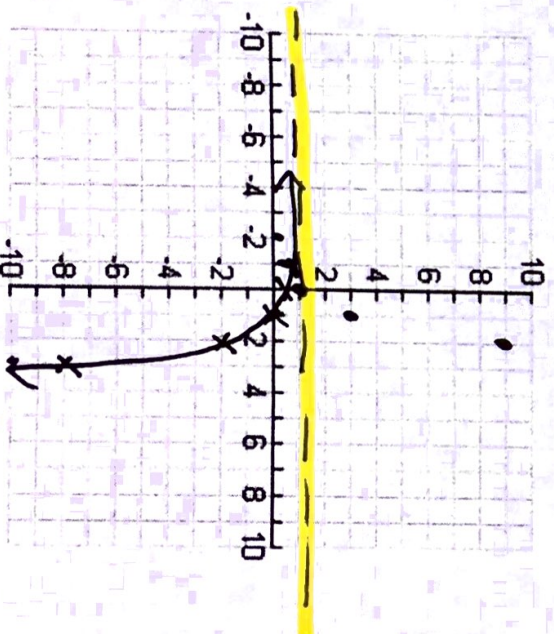
$\{x | x = \mathbb{R}\}$

Range:

$\{y | y < 1\}$

Asymptote:

$y = 1$



4.  $y = 3x^3 + 2$

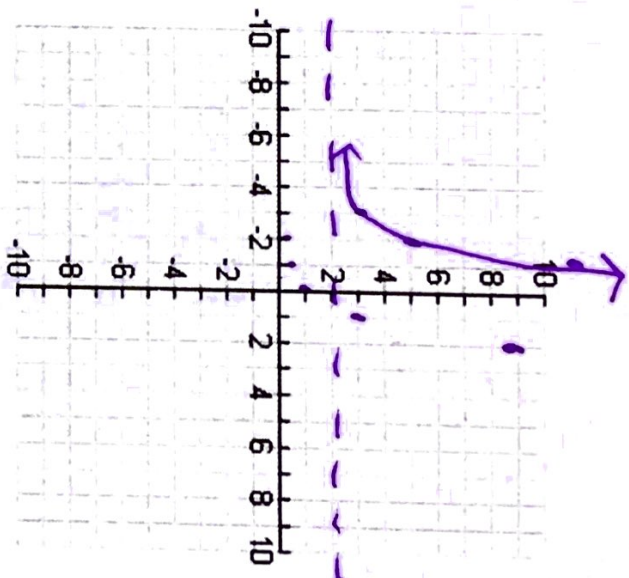
Shifts: left 3

up 2

Domain:  $\{x | x \in \mathbb{R}\}$

Range:  $\{y | y \geq 2\}$

Asymptote:  $y = 2$



5.  $2 \cdot \left(\frac{1}{2}\right)^{(x+3)} - 4$

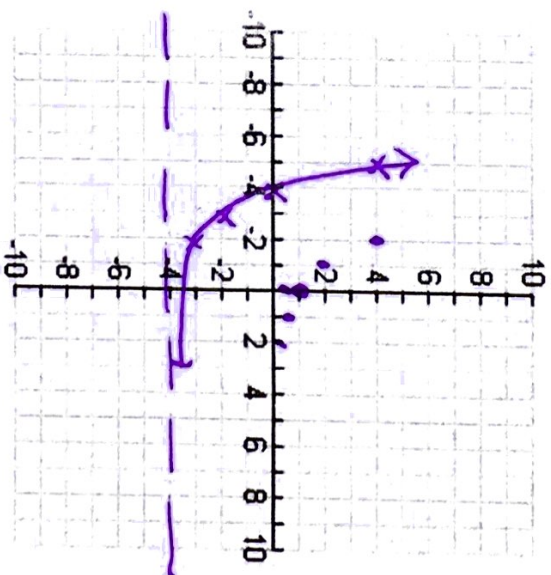
Shifts: v.s. 2  
left 3, down 4

Domain:  $\{x | x \in \mathbb{R}\}$

Range:  $\{y | y > -4\}$

Asymptote:  $y = -4$

x	y
-2	1
-1	2
0	1/2
1	1/4
2	1/8



6.  $y = -22x^{-4} + 1$

Shifts: reflect over x

h. comp. 1/2

right 2

main:

$\{x | x \in \mathbb{R}\}$

Range:  $\{y | y < 1\}$

Asymptote:  $y = 1$

$2(2x^{-2})^{-1}$   
-2 + 1

