

Transformations with Exponential and Logarithmic Functions

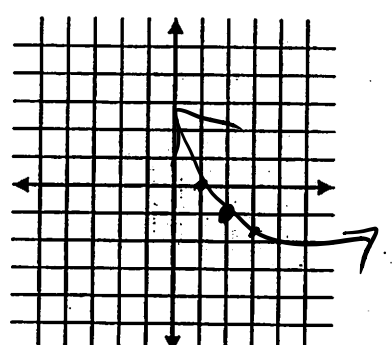
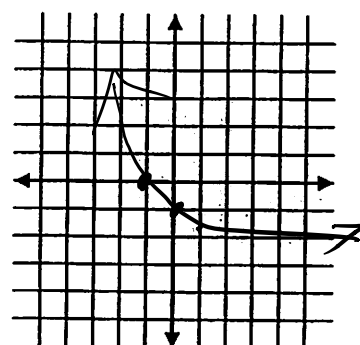
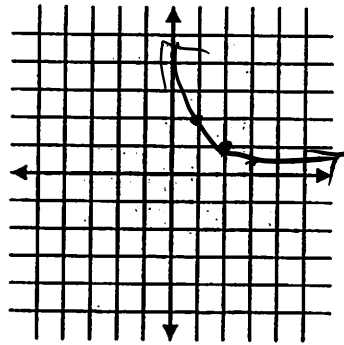
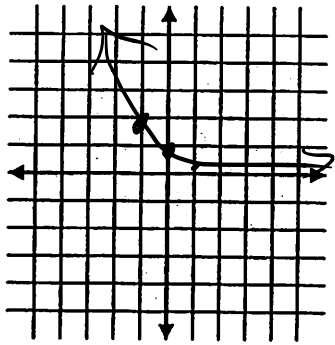
5. Describe in your own words what happens to the graph of $f(x) = \left(\frac{1}{2}\right)^x$ under the given transformations

then graph $f(x) = \left(\frac{1}{2}\right)^{x-2} - 2$

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

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

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



$f(x) = \left(\frac{1}{2}\right)^x$

x	y
-1	2
0	1
1	1/2

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

x	y
1	2
2	1
3	1/2

$f(x) = \left(\frac{1}{2}\right)^x - 2$
Down 2

x	y
-1	0
0	-1
1	-1 1/2

↓
y = -2

$f(x) = \left(\frac{1}{2}\right)^{x-2} - 2$
R+2
down 2

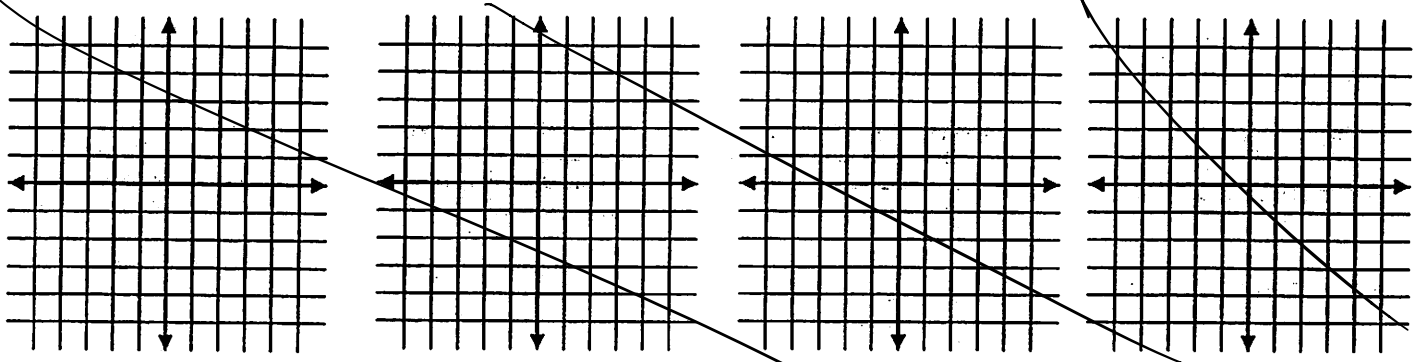
x	y
1	0
2	-1
3	-1 1/2

6. State the domain, range, intercepts and asymptotes of $f(x) = \left(\frac{1}{2}\right)^{x-2} - 2$

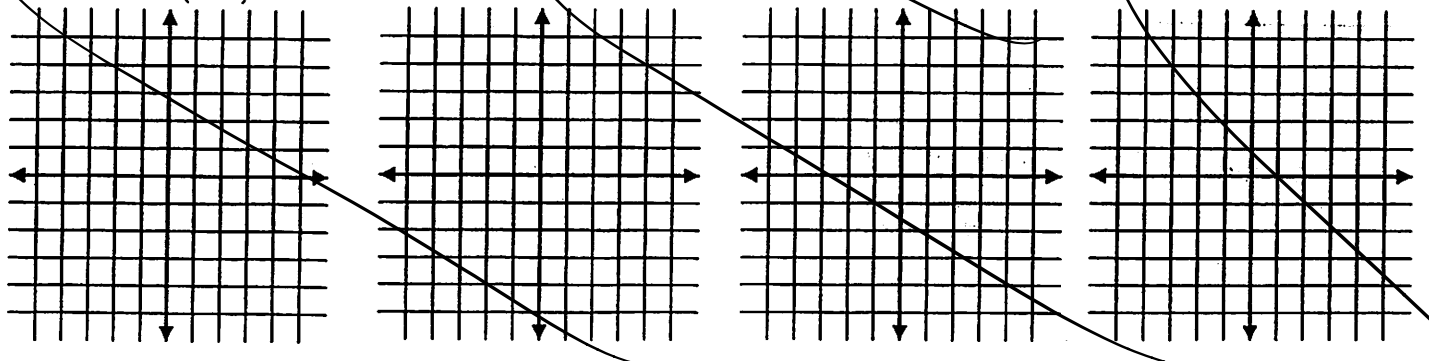
D $(-\infty, \infty)$
R $(-2, \infty)$

y = -2

7. Graph $f(x) = -3(2^{-x})$



8. Graph $f(x) = -3(2^{x-2})$



Transformations with Exponential and Logarithmic Functions

1. Describe in your own words what happens to the graph of $f(x) = 2^x$ under the given transformations then graph $f(x) = 2^{x+2} + 1$ by showing each step.

a. $f(x) = 2^{x+2}$

left 2

b. $f(x) = 2^x - 1$

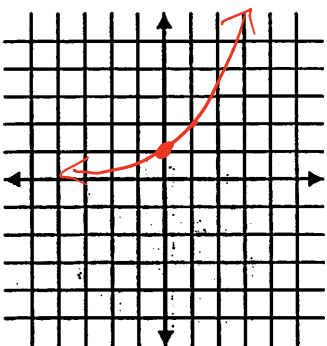
down 1

c. $f(x) = 2^{x+2} + 1$

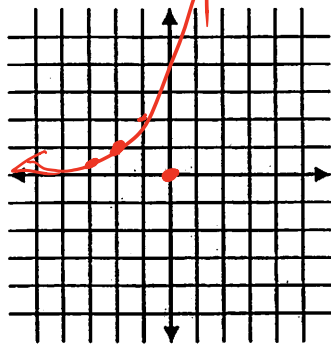
left 2
up 1

Domain = $(-\infty, \infty)$
Range = $(1, \infty)$

asymptote = $y = 1$

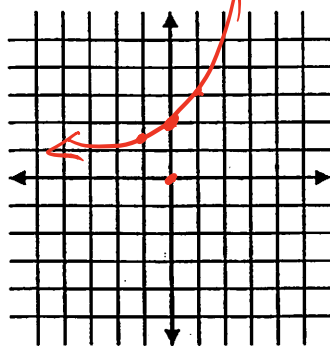


$f(x) = 2^x$



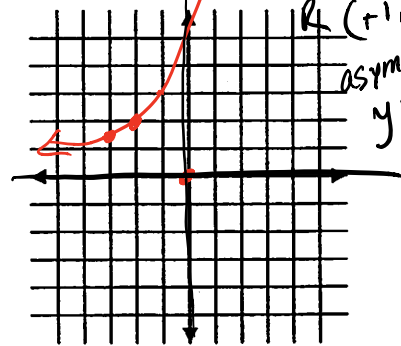
$f(x) = 2^{x+2}$

left 2



$f(x) = 2^x - 1$

up 1



$f(x) = 2^{x+2} + 1$

D $(-\infty, \infty)$
R $(1, \infty)$
asympt
 $y = 1$

left 2 up 1

x	y
-1	1/2
0	1
1	2

2. State the domain, range, intercepts and asymptotes of $f(x) = 2^{x+2} + 1$

x	y
-3	1/2
-2	1
-1	2

x	y
-1	1/2
0	1
1	2

x	y
-3	1/2
-2	1
-1	2

3. Describe in your own words what happens to the graph of $f(x) = 3^x$ under the given transformations then graph $f(x) = -3^x + 1$

a. $f(x) = -3^x$

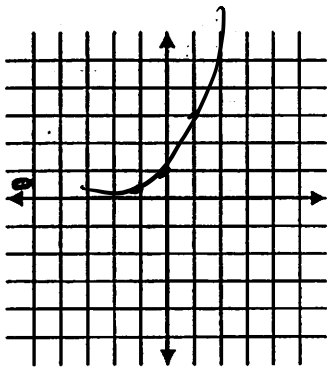
Reflects
over x-axis

b. $f(x) = 3^{x+1}$

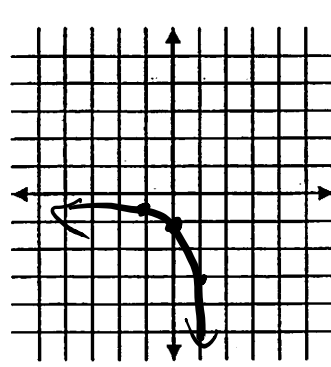
up 1

c. $f(x) = -3^{x+1} + 1$

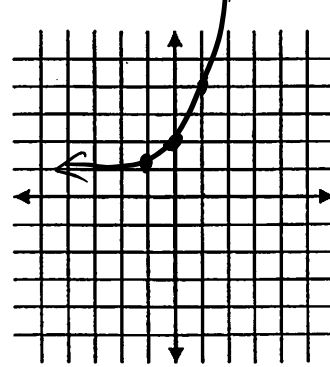
Reflected
over y-



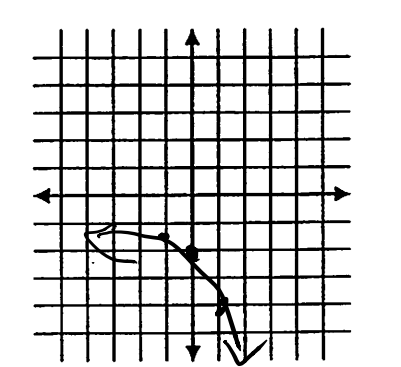
$f(x) = 3^x$



$f(x) = -3^x$



$f(x) = 3^{x+1}$



$f(x) = -3^{x+1} + 1$

x	y
-1	1/3
0	1
1	3

4. State the domain, range, intercepts and asymptotes of $f(x) = -3^{x+1} + 1$

x	y
-1	1/3
0	1
1	3

x	y
-1	1/3
0	1
1	3

x	y
-1	1/3
0	1
1	3