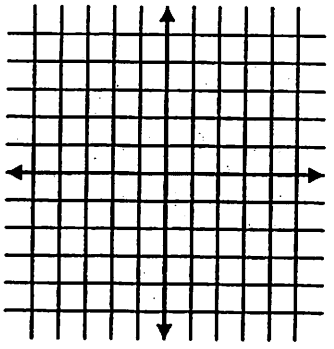
Transformations with Exponential and Logarithmic Functions

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

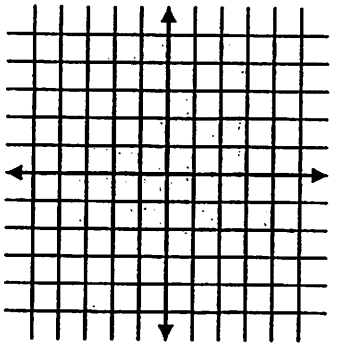
a. $f(x)=\left(\frac{1}{2}\right)^{x-2}$

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

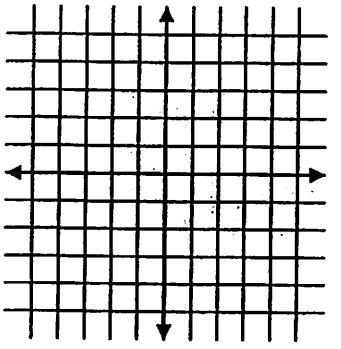
c. $f(x)=\left(\frac{1}{2}\right)^{x-2}-2$



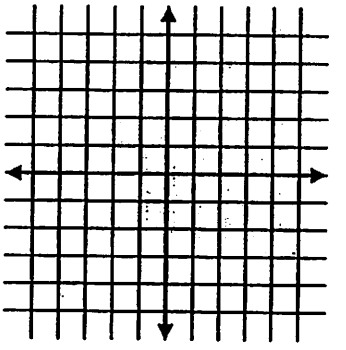
$f(x)=\left(\frac{1}{2}\right)^{x}$



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



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

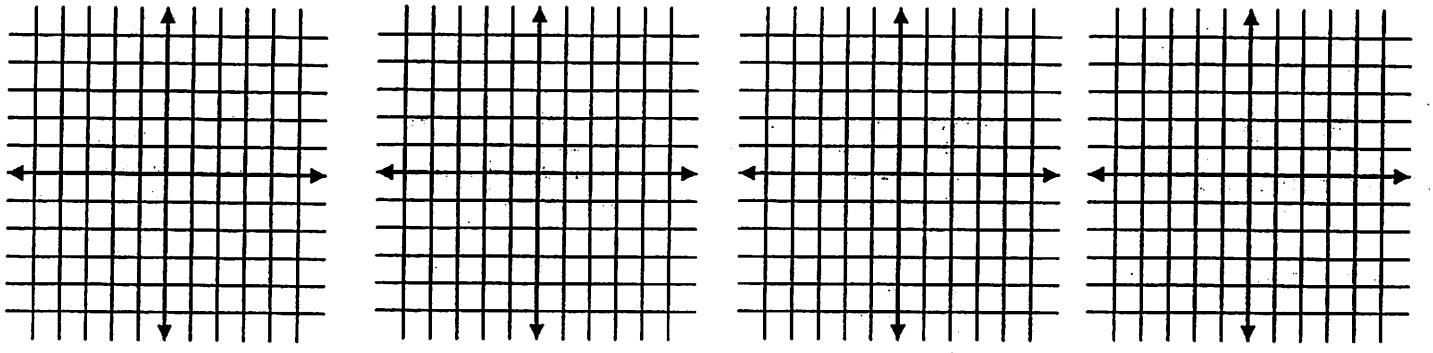


$f(x)=\left(\frac{1}{2}\right)^{x-2}-2$

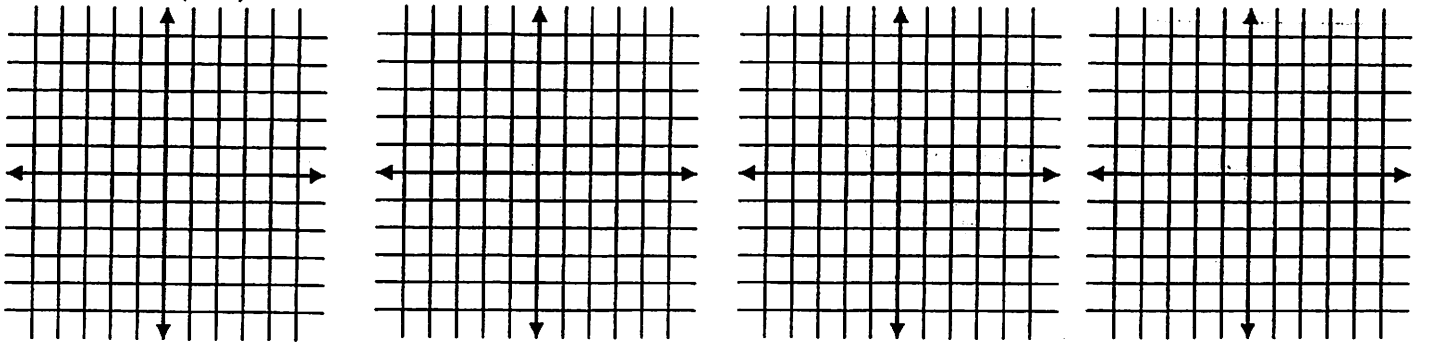
6. State the domain, range, intercepts and asymptotes of $f(x)=\left(\frac{1}{2}\right)^{x-2}-2$

---

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



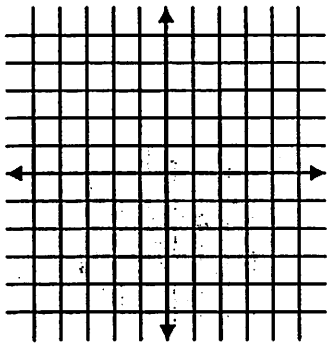
8. Graph $f(x)=-3\left(2^{x-2}\right)$



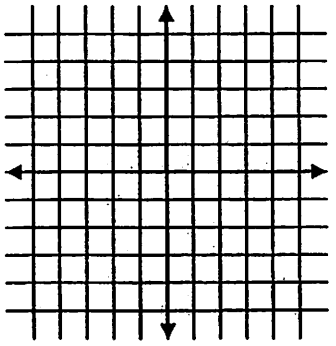
Transformations with Exponential and Logarithmic Functions

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.

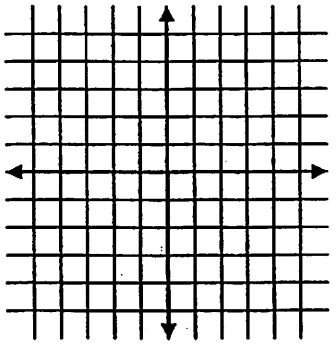
   a. $f(x) = 2^{x+2}$ b. $f(x) = 2^x - 1$ c. $f(x) = 2^{x+2} + 1$



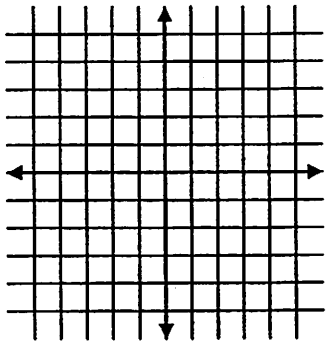
$f(x) = 2^x$



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



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



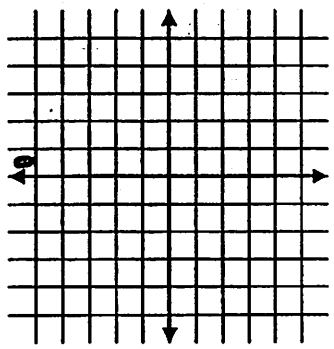
$f(x) = 2^{x+2} + 1$

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

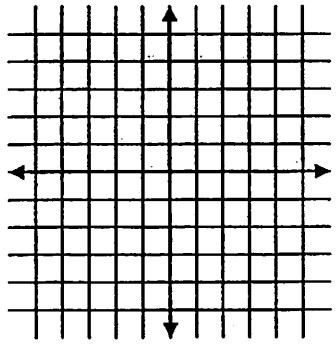
---

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

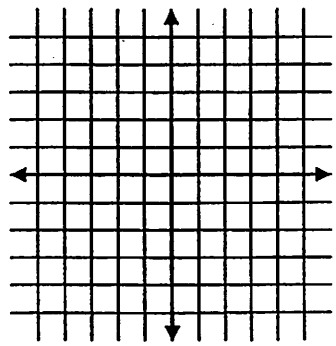
   a. $f(x) = -3^x$ b. $f(x) = 3^x + 1$ c. $f(x) = -3^x + 1$



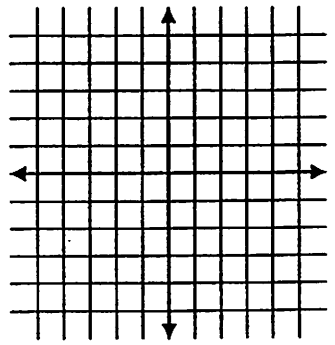
$f(x) = 3^x$



$f(x) = -3^x$



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

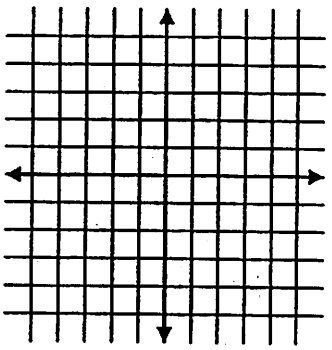


$f(x) = -3^x + 1$

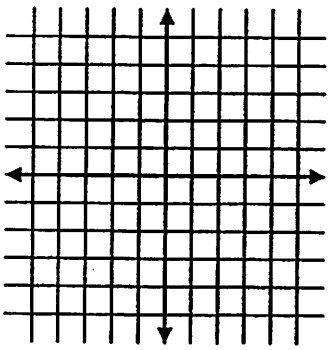
4. State the domain, range, intercepts and asymptotes of $f(x) = -3^x + 1$

5. Describe in your own words what happens to the graph of $f(x) = \log_2(x)$ under the under the given transformations then graph $f(x) = \log_2(-x) + 2$

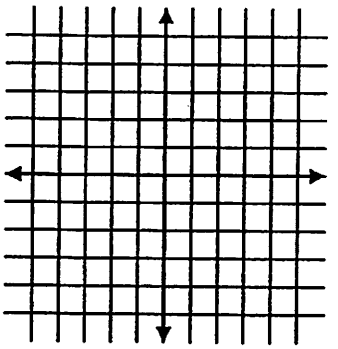
a. $f(x) = \log_2(-x)$ b. $f(x) = \log_2(x) + 2$ c. $f(x) = \log_2(-x) + 2$



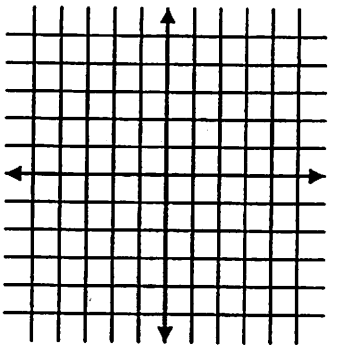
$f(x) = \log_2(x)$



$f(x) = \log_2(-x)$



$f(x) = \log_2(x) + 2$

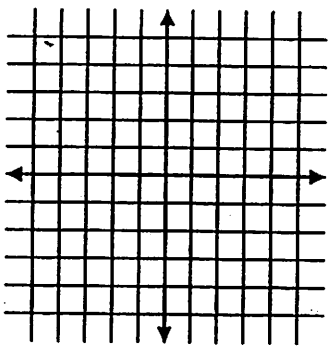


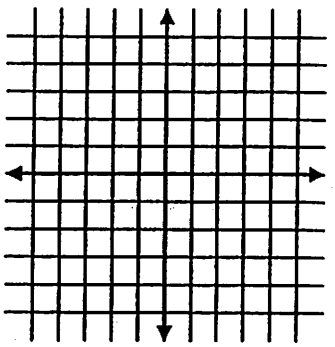
$f(x) = \log_2(-x) + 2$

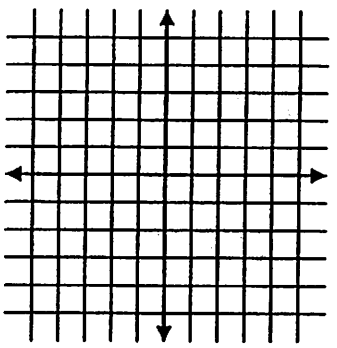
6. State the domain, range, intercepts and asymptotes of $f(x) = \log_2(-x) + 2$

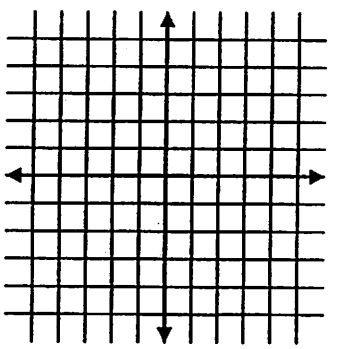
---

7. Graph $f(x) = -\log_2(-x) + 1$

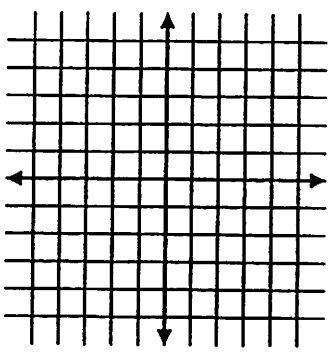


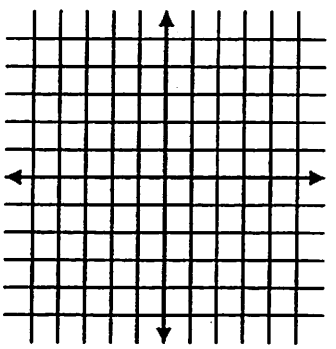


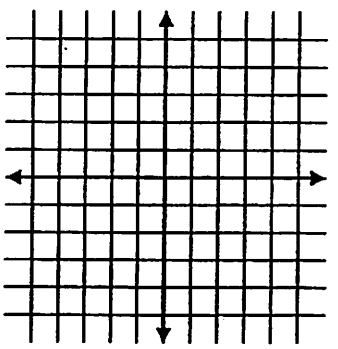


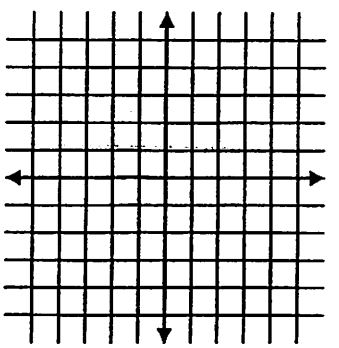


8. Graph $f(x) = -\log_2(x + 2) - 1$





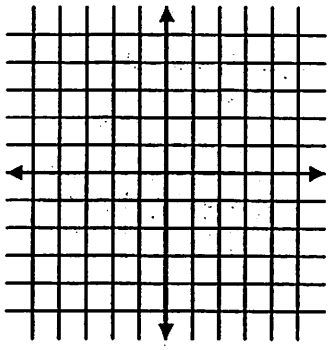




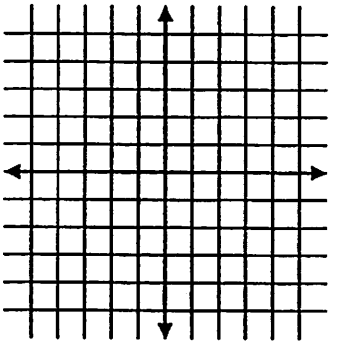
Transformations with Exponential and Logarithmic Functions

1. Describe in your own words what happens to the graph of $f(x) = \log_2(x)$ under the given transformations then graph by showing each step.

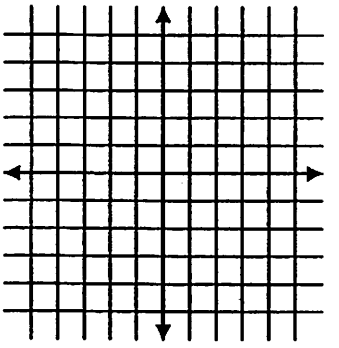
a. $f(x) = \log_2(x-2)$ b. $f(x) = \log_2(x)+3$ c. $f(x) = \log_2(x-2)+3$



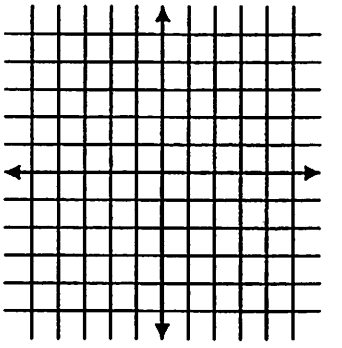
$f(x) = \log_2 x$



$f(x) = \log_2(x-2)$



$f(x) = \log_2(x)+3$



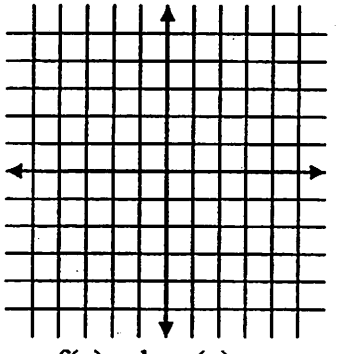
$f(x) = \log_2(x-2)+3$

2. State the domain, range, intercepts and asymptotes of $f(x) = \log_2(x-2)+3$

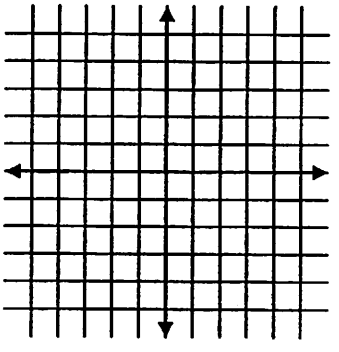
---

3. Describe in your own words what happens to the graph of $f(x) = \log_3(x)$ under the under the given transformations then graph $f(x) = -\log_3(x-2)$

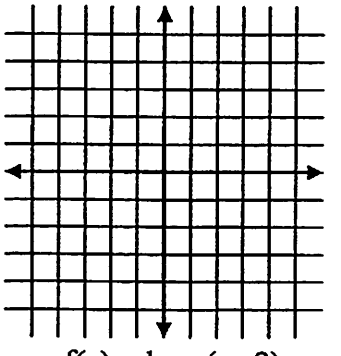
a. $f(x) = -\log_3(x)$ b. $f(x) = \log_3(x-2)$ c. $f(x) = -\log_3(x-2)$



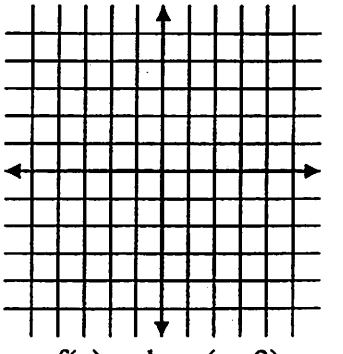
$f(x) = \log_3(x)$



$f(x) = -\log_3(x)$



$f(x) = \log_3(x-2)$



$f(x) = -\log_3(x-2)$

4. State the domain, range, intercepts and asymptotes of $f(x) = -\log_3(x-2)$

Math Analysis 1 Honors Graphing LOGS and Exponential functions
Homework

For each function, state if it is increasing or decreasing. State the equation of the vertical or horizontal asymptote for each function. Then graph. Be sure to label at least one key point.

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

14. $y = 4^{x-2} + 1$

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

16. $y = 3^{-x}$

17. $y = \log_3 x$

18. $y = \left(\frac{1}{5}\right)^{x-3} + 2$

19. $y = 5^{x-4} - 3$

20. $y = \log_4(x+3) - 1$

21. $y = \log_3(x-4) + 5$

22. $y = \log_{1/2}(x-5)$

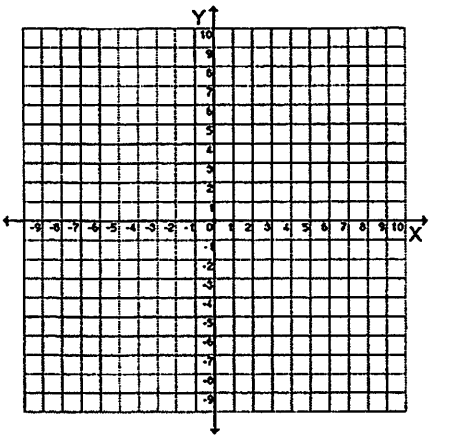
23. $y = -2^x$

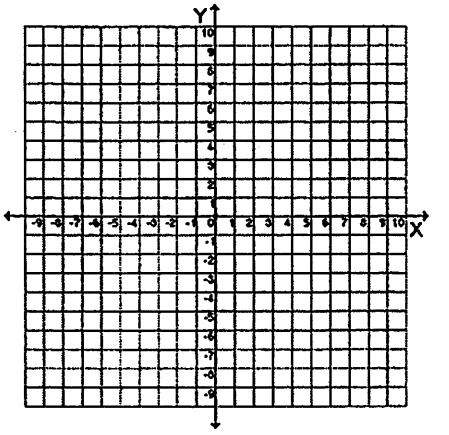
24. $y = -\log_4(x-1)$

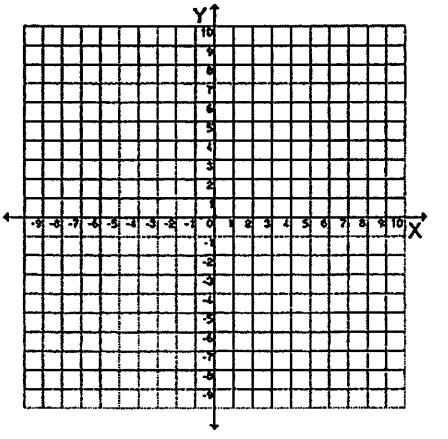
25. $y = \left(\frac{1}{3}\right)^{-2}\left(\frac{1}{3}\right)^{x}$

26. $y = \log_{1/4}(x+2) - 3$

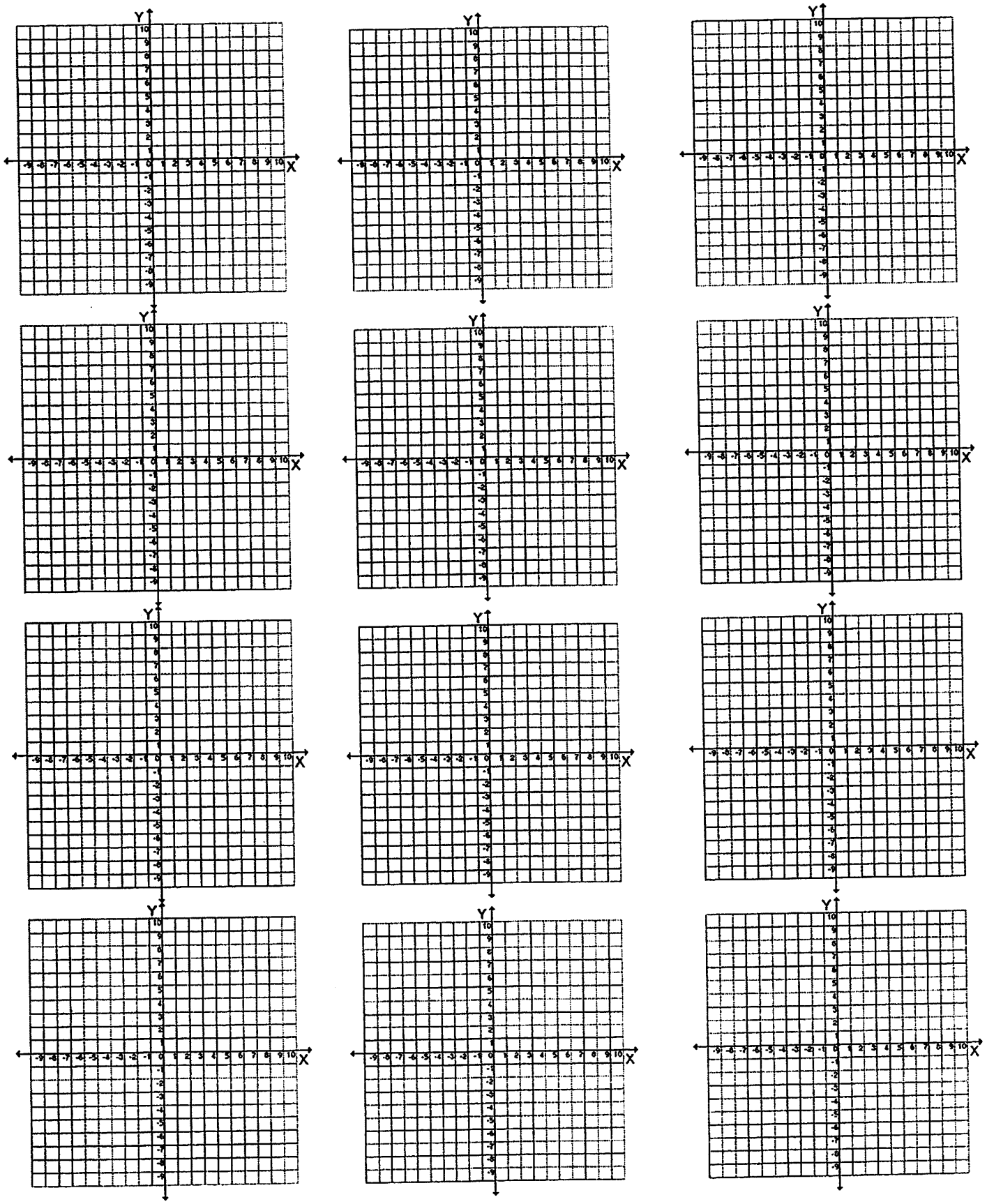
27. $y = -5 + \log_7(x+1)$





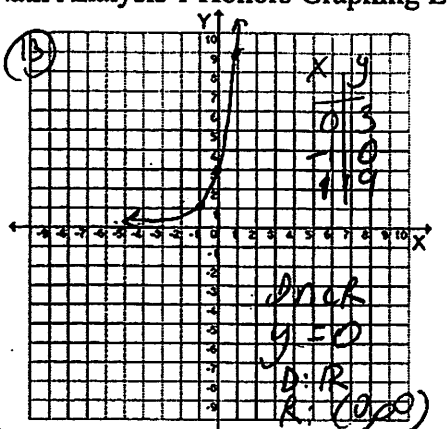


. Math Analysis 1 Honors Graphing LOGS and Exponential functions



.ath Analysis 1 Honors Graphing LOGS and Exponential functions

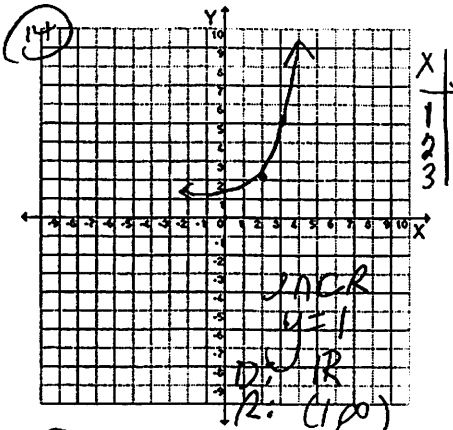
(13)



x	y
0	3
1	9

incr
$y=0$
D: R
R: $(0,\infty)$

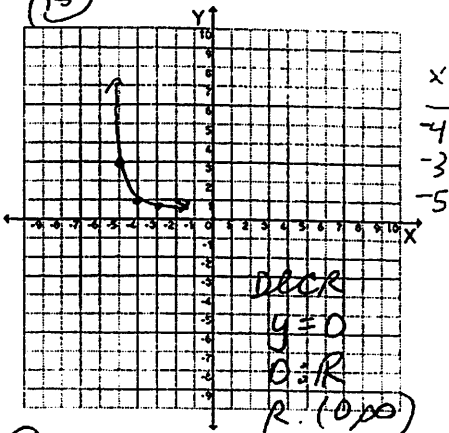
(14)



x	y
1	1.25
2	2
3	5

incr
$y=1$
D: R
R: $(1,\infty)$

(15)



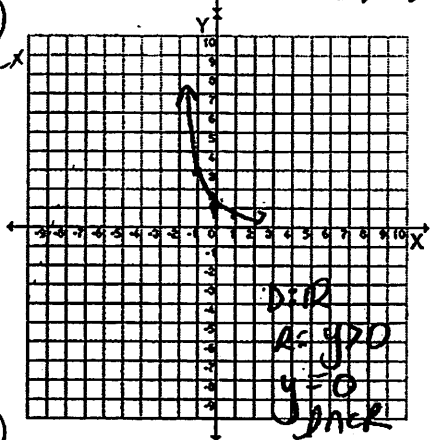
x	y
-4	1/
-3	1
-5	2

decr
$y=0$
D: R
R: $(0,\infty)$

(16)

$y=3^{-x}$

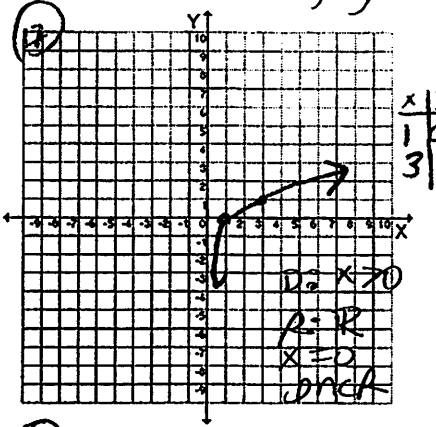
x	y
-1	3
0	1
1	1/3



D: R
R: $y>0$
$y=0$
incr

(17)

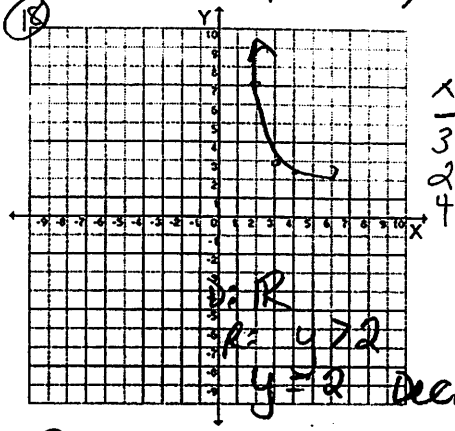
x	y
1	0
3	1



D: $x>0$
R: R
$x=0$
incr

(18)

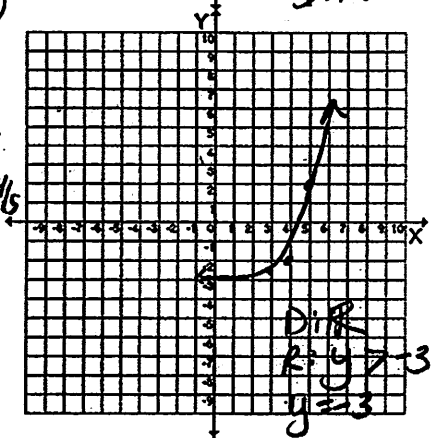
x	y
3	
2	
4	2



D: R
R: $y>2$
$y=2$
decr

(19)

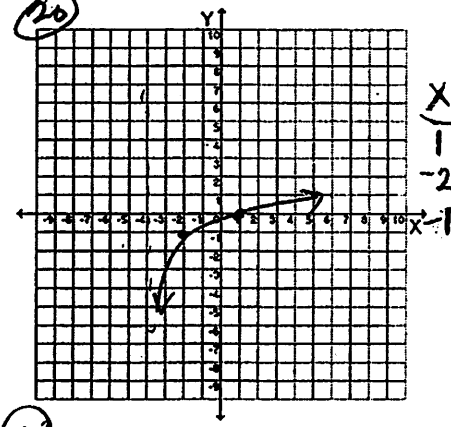
x	y
4	-2
5	2
3	-2 4/5



D: R
R: $y>-3$
$y=3$

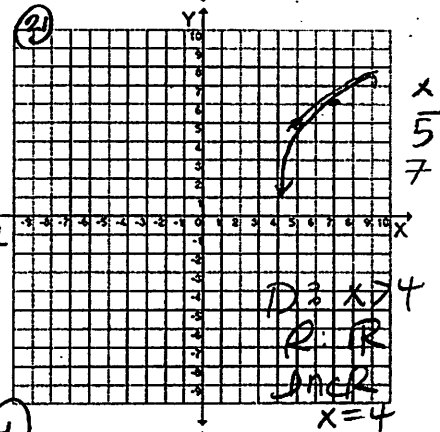
(20)

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



(21)

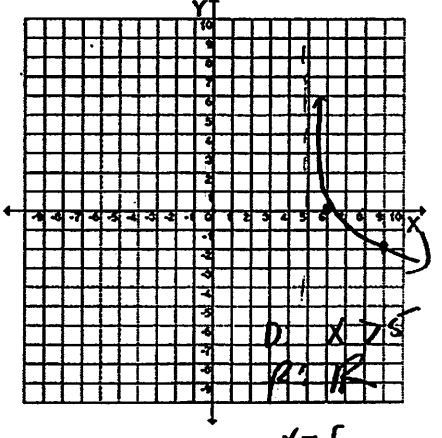
x	y
5	5
7	6



D: $x>4$
R: R
incr
$x=4$

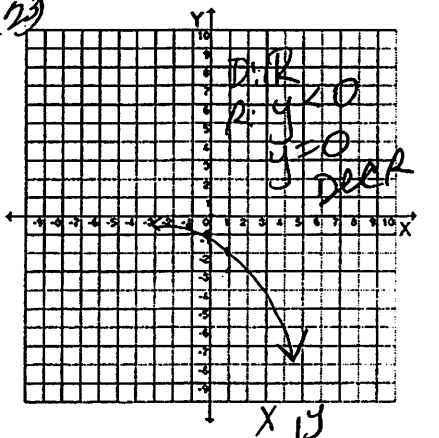
(22)

x	y
6	0
9	-2



D: $x>5$
R: R
$x=5$
decr

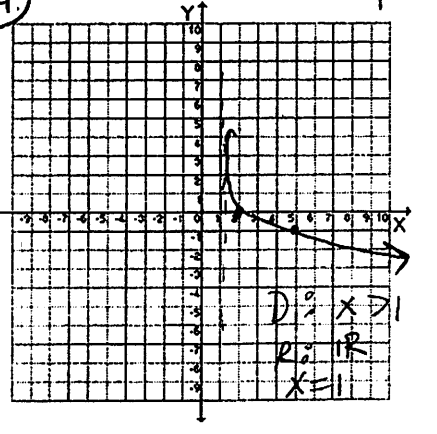
(23)



D: R
R: $y<0$
$y=0$
decr

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

(24)



D: $x>1$
R: R
$x=1$

$y=-\log_4(x-1)$

x	y
2	0
5	-1

Math Analysis 1 Honors Graphing LOGS and Exponential functions
Homework

For each function, state if it is increasing or decreasing. State the equation of the vertical or horizontal asymptote for each function. Then graph. Be sure to label at least one key point.

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

14. $y = 4^{x-2} + 1$

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

16. $y = 3^{-x}$

17. $y = \log_3 x$

18. $y = \left(\frac{1}{5}\right)^{x-3} + 2$

19. $y = 5^{x-4} - 3$

20. $y = \log_4(x+3) - 1$

21. $y = \log_3(x-4) + 5$

22. $y = \log_{1/2}(x-5)$

23. $y = -2^x$

24. $y = -\log_4(x-1)$

25. $y = \left(\frac{1}{3}\right)^{-2}\left(\frac{1}{3}\right)^{x} = \left(\frac{1}{3}\right)^{x-2} = (3^{-1})^{x-2}$

3^{-x+2}

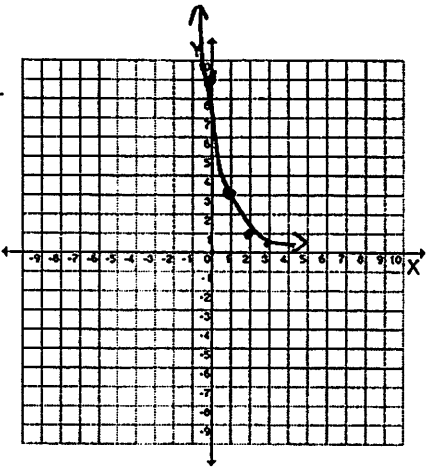
26. $y = \log_{1/4}(x+2) - 3$

27. $y = -5 + \log_7(x+1)$

(25)

$y = 3^{-x+2}$

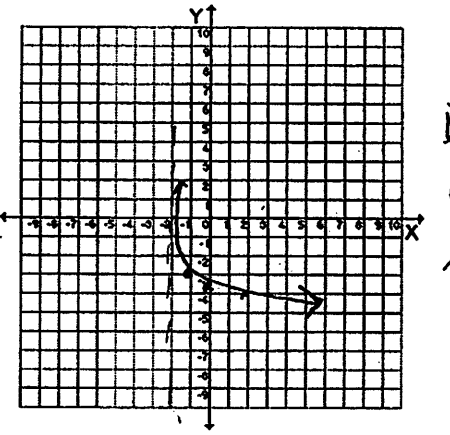
x	y
-1	27
0	9
1	3
2	1
3	1/3



D: R
R: $y > 0$
$y = 0$
Decr

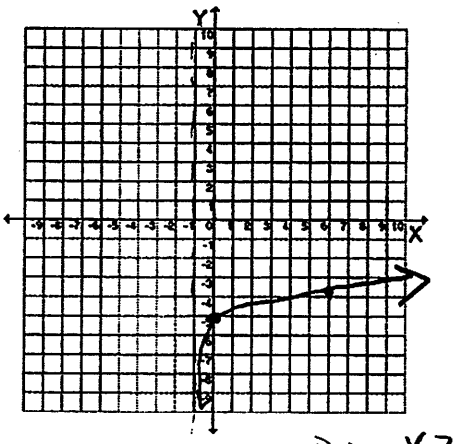
(26)

x	y
-1	-3
0	-3½
2	-4



D: $x > -2$
R: IR
$x = -2$
Decr

(27)



D: $x > -1$
R: IR
$x = -1$
Incr

x	y
0	-5
6	-4