

Given the table determine whether it represents a linear or exponential function. Justify your answer.

1.

X	Y
-2	4
-1	8
0	16
1	32
2	64
3	128

$\rightarrow *2$
 $\rightarrow *2$

Linear / Exponential

Justify:

Multiplied by the same number every time x increases by 1.

Graph the following function and give the necessary information.

3.

$$f(x) = (3)^{x+2} - 1$$

x Intercept: $(-2, 0)$

* Plug in 0 for x

y Intercept: $(0, 8)$

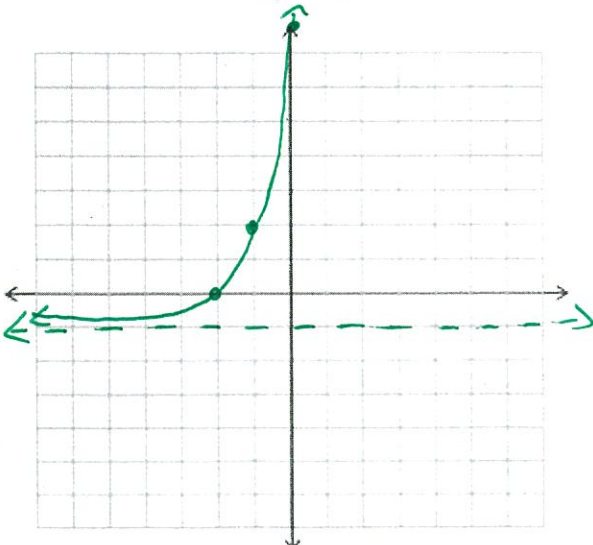
* Plug in 0 for x

Asymptotes: $y = -1$

Growth or decay? because $3 > 1$

Domain: $(-\infty, \infty)$

Range: $(-1, \infty)$



Choose these to find

x	y
-2	0
-1	2
0	8
1	26
2	80

2.

X	Y
-2	-3.5
-1	-3.25
0	-3
1	-2.75
2	-2.5
3	-2.25

$\rightarrow +.25$
 $\rightarrow +.25$

Linear / Exponential

Justify:

Adds the same number every time x increases by 1.

hard!

$$f(x) = -\left(\frac{1}{4}\right)^{x-1}$$

$y = \frac{1}{4}x + 1$
 $\log_{\frac{1}{4}} 0 = x - 1$

x Intercept: ~~None!~~

negative reflects it over the y

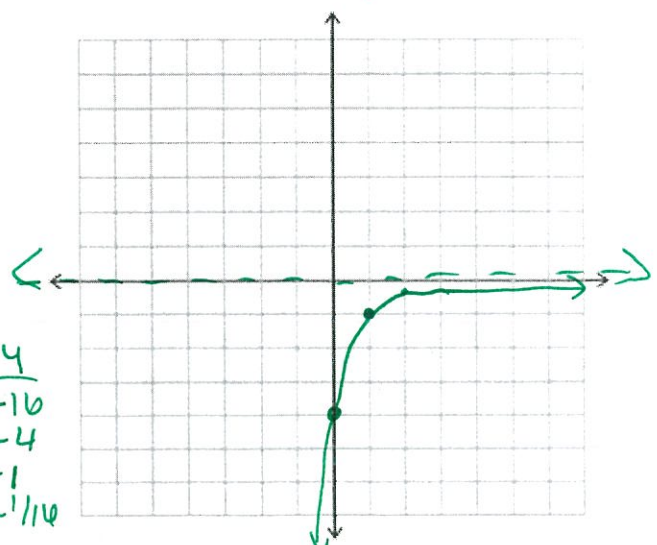
y Intercept: $(0, -4)$

Asymptotes: $y = 0$ (nothing add or sub)

Growth or decay? $\frac{1}{4} < 1$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 0)$



x	y
-1	-1/4
0	-1
1	-1/4
2	-1/16

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

Asymptote is opposite and vertical

x Intercept: $(3, 0)$

y Intercept: None ☺

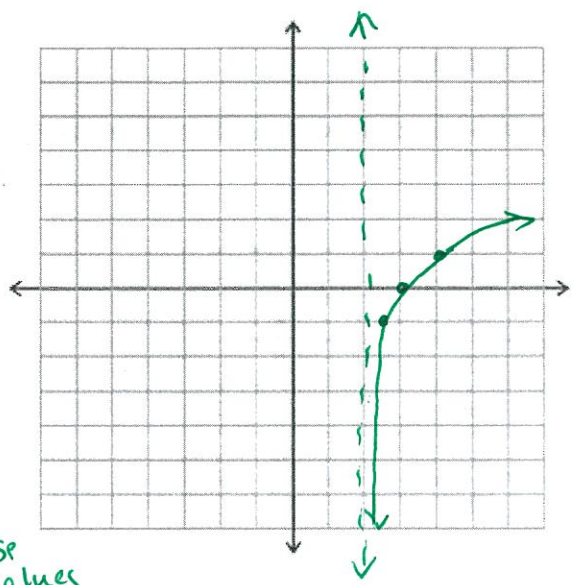
Asymptotes: $x = 2$

Domain: $(2, \infty)$

Range: $(-\infty, \infty)$

LOOP!
 $2^y = x - 2$

x	y	x	y
$2\frac{1}{2}$	-1	2	2
3	0	3	3
4	1	4	4
6	2	6	2



6. $f(x) = \log_2(x + 1) - 4$

Asymptote

x Intercept: $(15, 0)$

y Intercept: $(0, -4)$

Asymptotes: $x = -1$

Domain: $(-1, \infty)$

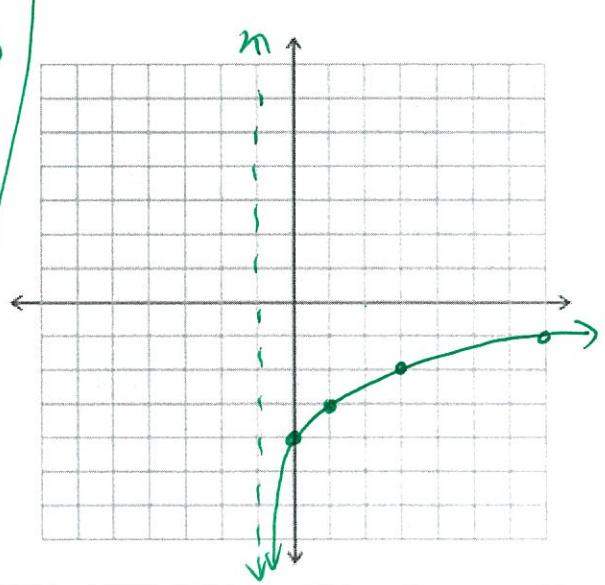
Range: $(-\infty, \infty)$

Choose y-values

Asymptote

LOOP!
 $2^{y+4} = x + 1$

x	y
0	-4
1	-3
3	-2
7	-1
	0



7. Using the given parent functions modify the equation so that the following transformation is true.

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

Right 4, down 6

$$f(x) = 2(3)^{x-3-4} - 6$$

New equation:

$$f(x) = 2(3)^{x-7} - 6$$

b. $f(x) = \log(x + 4) - 7$

Left 2, up 3

$$f(x) = \log(x + 4 + 2) - 7 + 3$$

New equation:

$$f(x) = \log(x + 6) - 4$$

8. Describe functions where there are reflections. Be specific in your description.

There are reflections over the asymptote when the function has a negative sign in front of it. (i.e. $f(x) = -\log(x)$)