

Look at each equation and identify any transformations (shifts or reflections) of the tool kit function. Identify at least 3 critical points for each function. Then sketch the graph, state its domain, range and the equation of the asymptote.

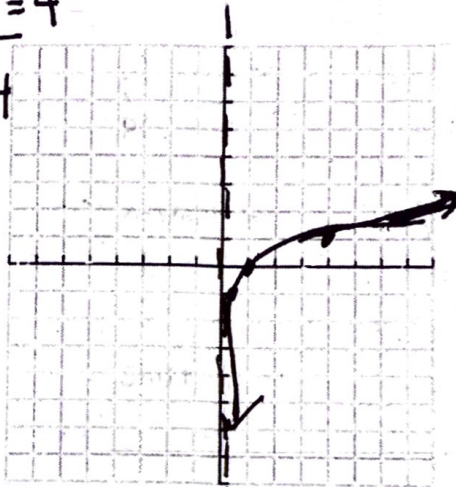
1. $f(x) = \log_4 x$ → inverse → $y = 4^x$

$\log_4 X$ ← BASE = 4

x	f(x)
1/4	-1
1	0
4	1
16	2

Asymptote: $x = 0$
 Domain: $(0, \infty)$
 Range: $(-\infty, \infty)$

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



2. $f(x) = \log_3(x - 2)$ → $y = 3^x$

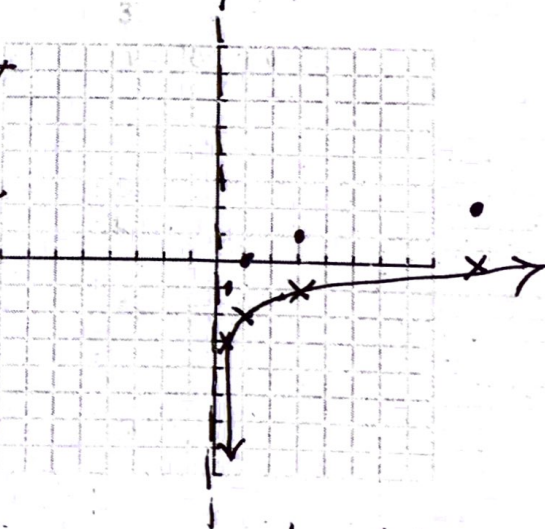
x	f(x)
1/3	-1
1	0
3	1
9	2

Transformations: down 2
 Did not move $\frac{1}{2}$!
 Asymptote: $x = 0$
 Domain: $(0, \infty)$
 Range: $(-\infty, \infty)$

FLIP!

TABLE: $y = \log_4 x$

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



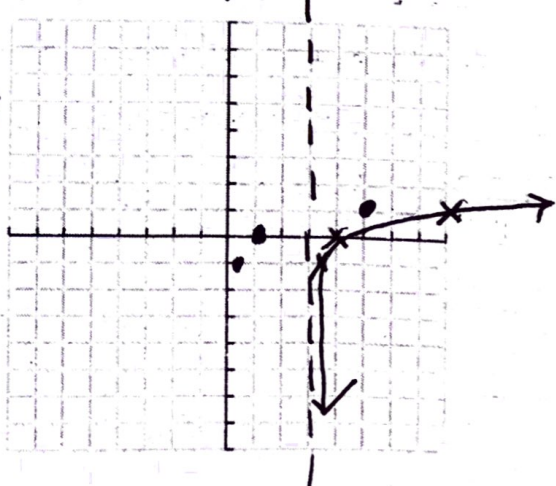
3. $f(x) = \log_5(x - 3)$ → $y = 5^x$

x	f(x)
1/5	-1
1	0
5	1

$y = \log_5 x$

Transformations: right 3
 Asymptote: $x = 3$
 Domain: $(3, \infty)$
 Range: $(-\infty, \infty)$

x	y
-1	1/5
0	1
1	5



✓ 4. $f(x) = -\log_2(x+1) + 5$

x	f(x)
0	5
1	4
3	3
7	2

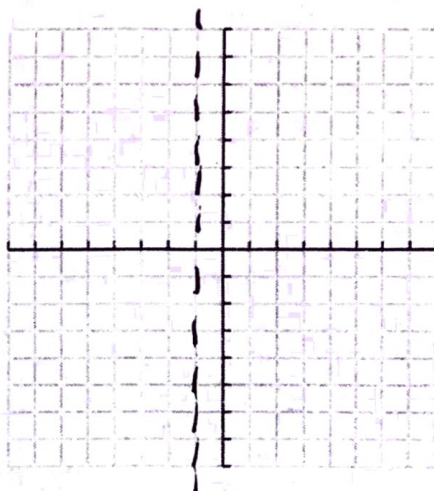
Transformations:

reflect over x | ^{left} ~~right~~ 1 | up 5

Asymptote: $x = -1$

Domain: $\{x | x > -1\}$

Range: $\{y | y \in \mathbb{R}\}$



✓ 5. $f(x) = \log_2 x - 5$

x	f(x)
1	-5
2	-4
4	-3
8	-2

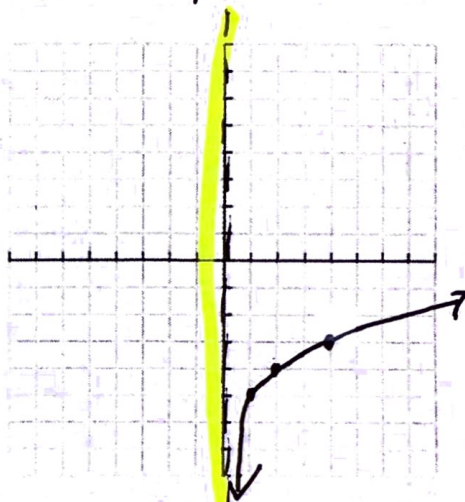
Transformations:

down 5

Asymptote: $x = 0$

Domain: $(0, \infty)$

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



✓ 6. $f(x) = \log_2(x+2) - 3$

x	f(x)
-1	-3
0	-2
2	-1
6	0

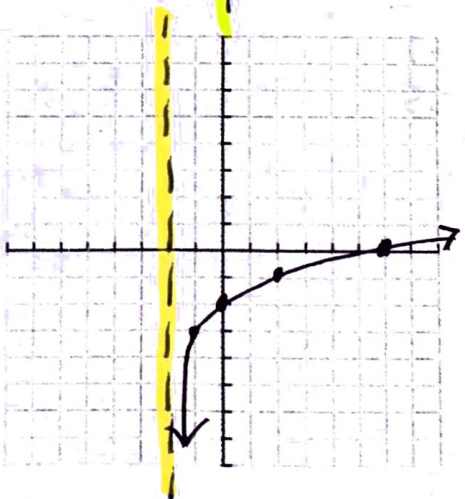
Transformations:

left 2, down 3

Asymptote: $x = -2$

Domain: $(-2, \infty)$

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



✓ 7. $f(x) = \log_4(x-3)$

x	f(x)
4	0
5	1/2
7	1
11	1.5

Transformations:

right 3

Asymptote: $x = 3$

Domain: $(3, \infty)$

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

