

GRAPHING LOGARITHMIC FUNCTIONS – NOTES

Directions: For the following examples, create a table of values and plot the points on the provided coordinate plane.

1. Review : Sketch the graph of $f(x) = 3^x$.

x	y
-2	$\frac{1}{9}$
-1	$\frac{1}{3}$
0	1
1	3
2	9

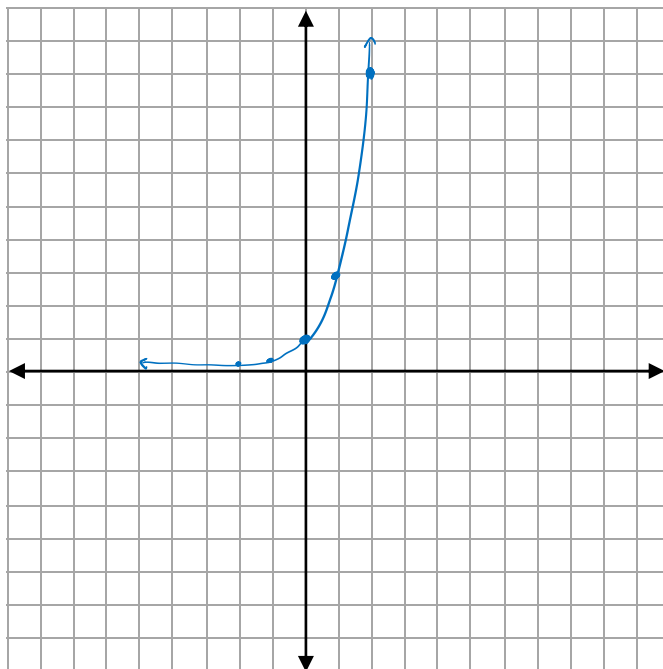
x-int: DNE

y-int: (0,1)

Domain: \mathbb{R}

Range: $y > 0$

Asymptote: $y = 0$



2. Sketch the graph of $f(x) = \log_3 x$.

x	y
$\frac{1}{9}$	-2
$\frac{1}{3}$	-1
1	0
3	1
9	2

$$y = \log_3 x$$

$$3^y = x$$

Choose values
for y!

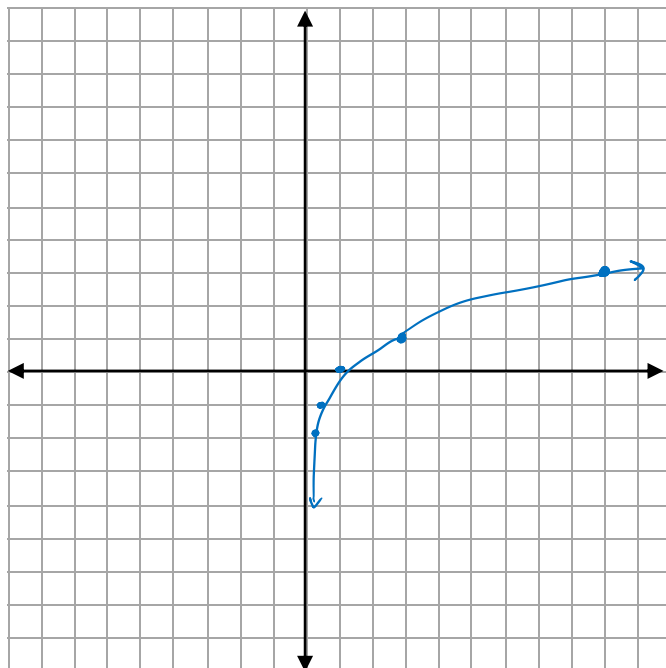
x-int: (1,0)

y-int: DNE

Domain: $x > 0$

Range: \mathbb{R}

Asymptote: $x = 0$



3. Sketch the graph of $f(x) = \log_{\frac{1}{2}} x$.

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

$$y = \log_{\frac{1}{2}} x$$

$$\frac{1}{2}^y = x$$

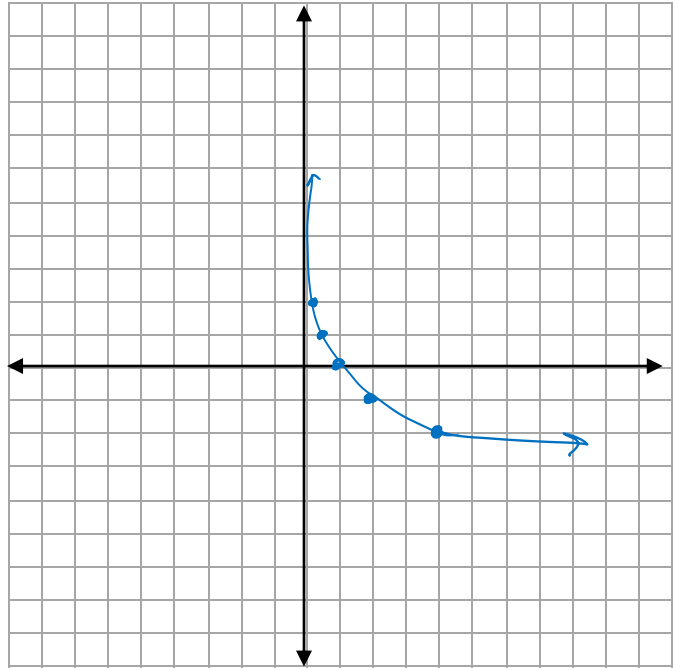
x-int: $(1, 0)$

y-int: DNE

Domain: $x > 0$

Range: \mathbb{R}

Asymptote: $x = 0$



4. Sketch the graph of $f(x) = -2 + \log_{\frac{1}{2}} x$.

x	y
1	-2
$\frac{1}{2}$	-1
$\frac{1}{4}$	0
$\frac{1}{8}$	1
$\frac{1}{16}$	2
$\frac{2}{4}$	-3
$\frac{4}{4}$	-4

$$y = -2 + \log_{\frac{1}{2}} x$$

$$y + 2 = \log_{\frac{1}{2}} x$$

$$\frac{1}{2}^{(y+2)} = x$$

← use additional pts!

x-int: $(\frac{1}{4}, 0)$

y-int: DNE

Domain: $x > 0$

Range: \mathbb{R}

Asymptote: $x = 0$

