

Exponential function :

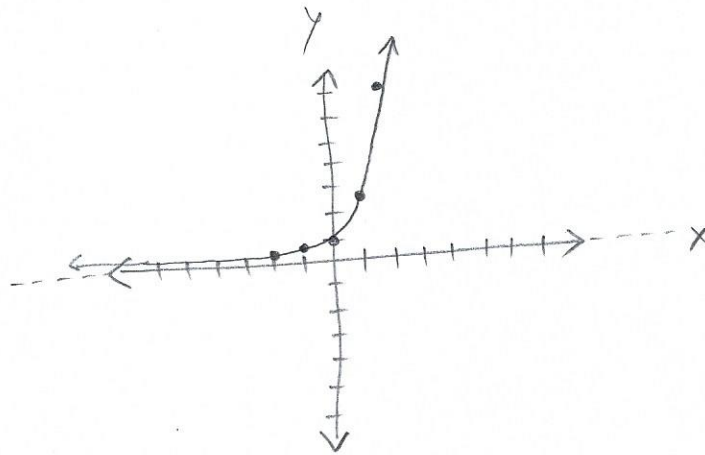
$$y = b^x$$

$$f(x) = b^x$$

$$f(x) = \left(\frac{8}{3}\right)^x$$

↑ $b > 1$

X	Y
-2	9/64
-1	3/8
0	1
1	8/3 = 2 $\frac{2}{3}$
2	64/9 = 7 $\frac{1}{9}$



Logarithm :

$$\log_a c = b \quad \text{means} \quad a^b = c$$

For any numbers a, b and c
with $a > 0$ and $c > 0$ and $a \neq 1$

$$\log_7 49 = ?$$

$$7^? = 49$$

$$7^? = 7^2$$

$$? = 2$$

$$b^x = b^y$$

$$x = y$$

$$y = \left(\frac{8}{3}\right)^x$$

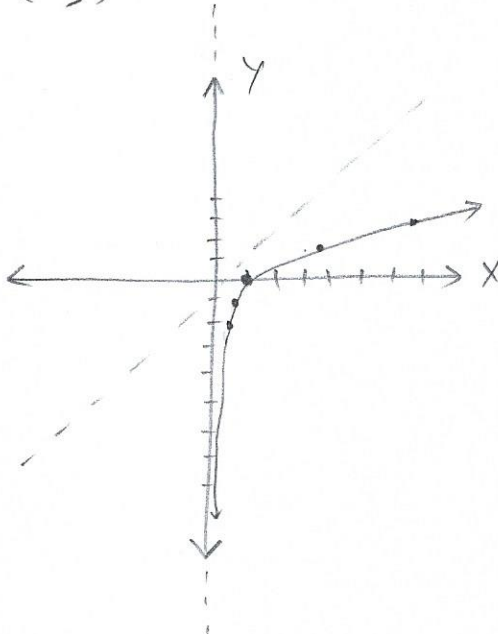
$$\log_{8/3} y = x$$

x	y
9/64	-2
3/8	-1
1	0
2 2/3	1
7 1/9	2

Inverse

$$\log_{8/3} x = y$$

$$\left(\frac{8}{3}\right)^y = x$$



$$\log_{10} 100 = 2$$

base 10 if its not written

$$10^? = 100$$

$$? = 2$$

$$\log\left(\frac{1}{10}\right) = -1$$

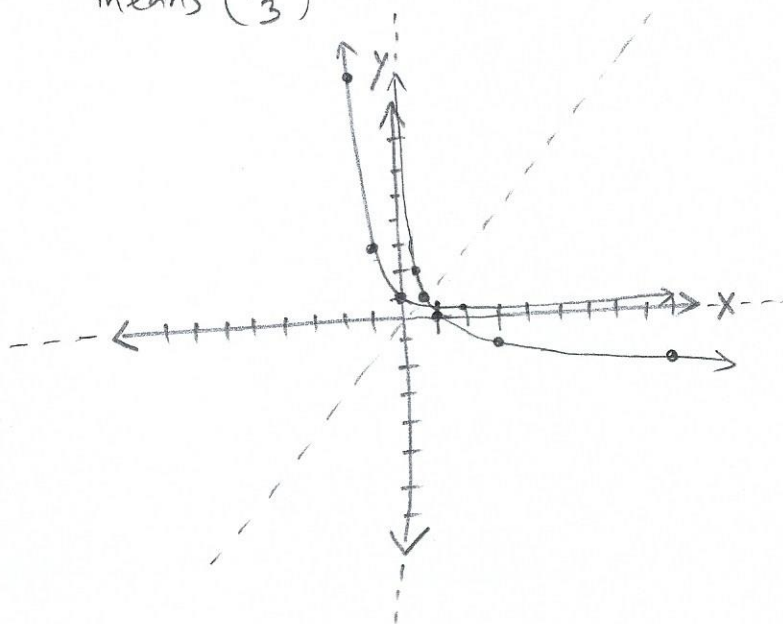
$$10^? = \frac{1}{10}$$

$$10^? = 10^{-1}$$

$$? = -1$$

Graph $f(x) = \log_{1/3} x$ means $\left(\frac{1}{3}\right)^y = x$

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



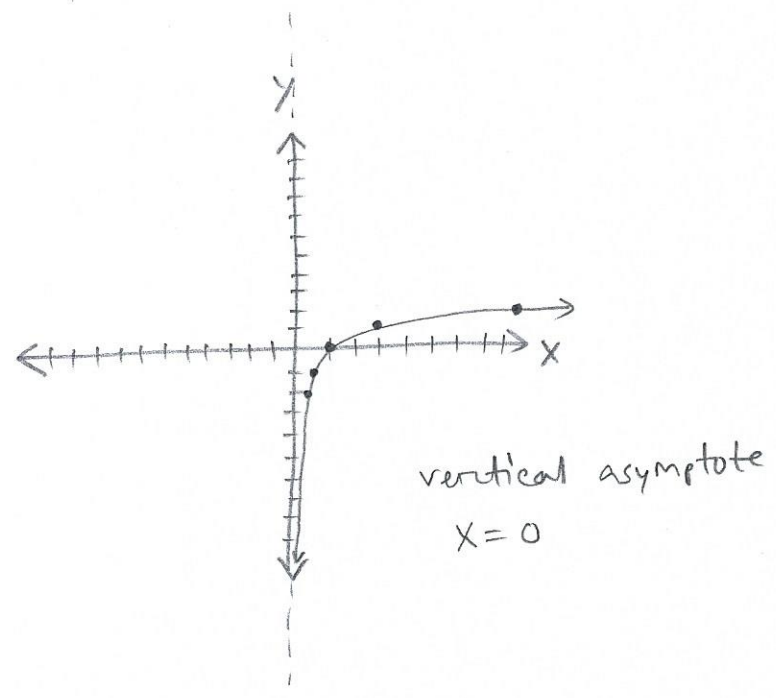
$$y = \left(\frac{1}{3}\right)^x$$

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

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

$$3^y = x$$

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



$$5^{-2} = \frac{1}{25}$$



$$\log_5 \frac{1}{25} = -2$$

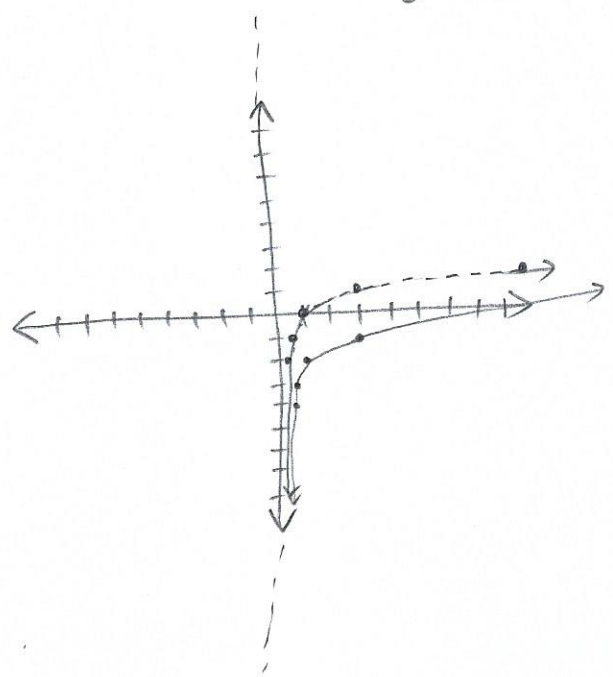
$$f(x) = -2 + \log_3 x$$

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

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

$$y = \log_3 x$$

$$3^y = x$$



A principal of \$3900 is invested @ 7.25%, compounded annually.
How much will the investment be worth after 7 years?

a is the starting amount

$$a(1+r)^t$$

r is the rate as a decimal

t is the number of years.

$$\begin{aligned} & 3900(1+0.0725)^7 \\ &= 3900(1.0725)^7 \\ &\approx 6366 \end{aligned}$$

$$\# \quad g(g^{-1}(x)) = x$$

$$g^{-1}(g(x)) = x$$

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

$$g(x) = x + 2$$

$$f(g(x)) = x + 2 - 2 = x$$

$$g(f(x)) = x - 2 + 2 = x$$

They are inverse

$$f(x) = \frac{1}{6x}, \quad x \neq 0$$

$$g(x) = -\frac{1}{6x}, \quad x \neq 0$$

$$f(g(x)) = \frac{1}{6(-\frac{1}{6x})} = \frac{1}{-\frac{1}{x}} = -x$$

not inverse