

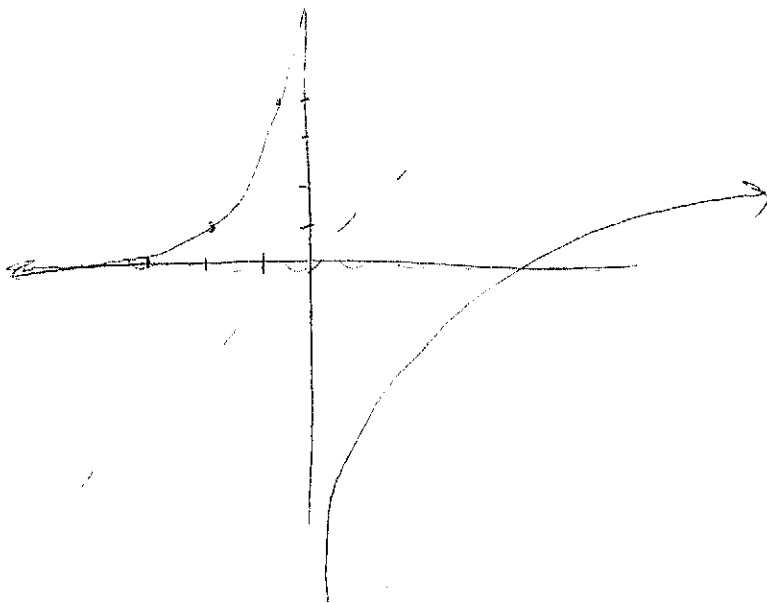
$$f(x) = 7$$

left 2

H.A. $y=0$

y-int: $(0, 16)$

\hookrightarrow pt $(0, 1) \Rightarrow (-2, 1)$



6.4

$$2^x = 8$$

$$x=3$$

$$2^x = 4$$

$$x=2$$

$$2^x = 6$$

$$2.5 - 2.6$$

$$2.58 - 2.58$$

$$2.584 - 2.585$$

$$2.5849 - 2.5850$$

$$2.58496 - 2.58497$$

Take exponential equations & write them as a logarithm, and back again to exp. functions.

$$2^{\overset{\text{Exp.}}{x}} = 6 \Rightarrow \overset{\text{Log.}}{\log_2}(6) = x$$

$$3^x = 15$$

$$\log_3 15 = x$$

* A logarithm is an exponent.

$$f(x) \quad x^4 = 24$$

$$\log_x 24 = 4$$

$$\ln 5 = x$$

$$e^x = 5$$

$$x \approx 1.60943$$

$$\log_7 5 = x$$

$$7^x = 5$$

$$2^x = 7$$

$$\log_2 7 = x$$

$$\log_5 15 = x$$

$$10^x = 15$$

$$x \approx 1.1761$$

An exponential function & a logarithmic function are inverses.

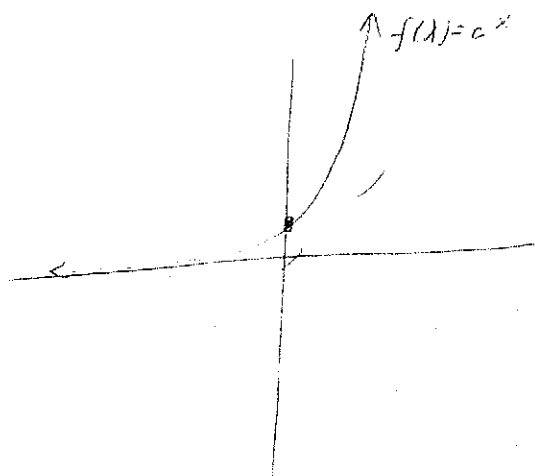
$$f(x) = a^x$$

Domain: All reals

Range: $\{y \mid y > 0\}$ \Rightarrow

H.A. $y = 0$

y-int: $(0, 1)$



$$y = a^x$$

$$x = a^y$$

$$\log_a x = y = f^{-1}(x)$$

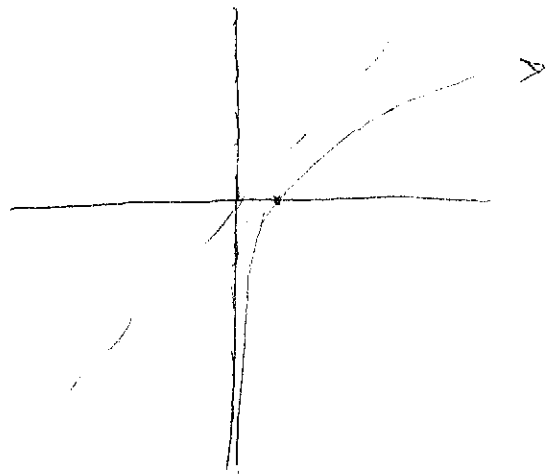
$$g(x) = \log_a x$$

Domain: $\{x \mid x > 0\}$

Range: All reals

v.A. $x = 0$ $\boxed{y\text{-axis}}$

x-int: $(1, 0)$



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

V.A. $x=0$

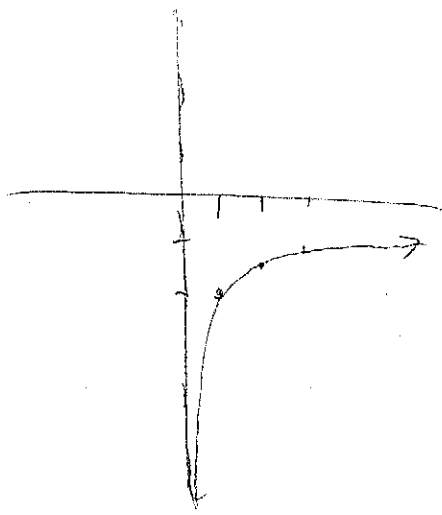
X-int. $(10, 0)$

$$(1, 0) \rightarrow (1, -2)$$

$$y = \log x - 2$$

$$y + 2 = \log x$$

x	y
10	0
1	-2



Ex) $\log_3 x = 2$

$$3^2 = x$$

$$9 = x$$

$$\log_8 \left(\frac{1}{8}\right) = x$$

$$8^x = \frac{1}{8}$$

$$x = -1$$

$$e^{-2x} = \frac{1}{3}$$

$$\log_e \left(\frac{1}{3}\right) = -2x$$

$$\frac{\ln\left(\frac{1}{3}\right)}{-2} = \frac{-2x}{-2}$$

$$\frac{\ln\left(\frac{1}{3}\right)}{-2} = x$$

$$\log_3 (x^2 + 1) = 2$$

$$3^2 = x^2 + 1$$

$$9 = x^2 + 1$$

$$8 = x^2$$

$$\pm\sqrt{8} = x$$

$$\pm 2\sqrt{2} = x$$

$$8 \cdot 10^{2x-1} = 3$$

$$10^{2x-1} = \frac{3}{8}$$

$$\log\left(\frac{3}{8}\right) = 2x - 1$$

$$\frac{\log\left(\frac{3}{8}\right) + 1}{2} = x$$

3.2870

