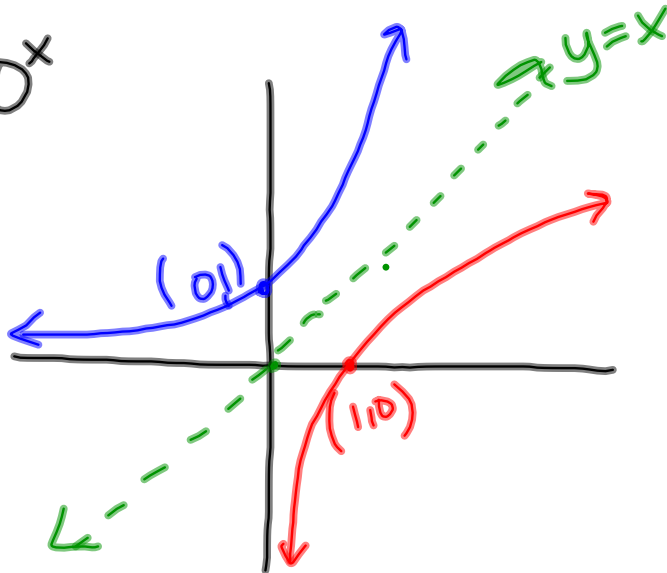


Chp. 8: Logarithmic Functions

Exponential Function with base 10.

$$y = 10^x$$

x	y
-2	1/100
-1	1/10
0	1
1	10
2	100



Inverse

x	y
1/100	-2
1/10	-1
1	0
10	1
100	2

$$y = 10^x$$

Switch

$$x = 10^y$$

To solve for y, we need logs.

$$\frac{\log x}{\log 10} = y$$

↑
1

$\log x = y$

pg. 373 Notation

$$y = c^x \Rightarrow y = \log_c x$$

$$\log_4 16 = 2$$

$$\Rightarrow 4^2 = 16$$

Solve using Logs (like bases)

Ex. 1 pg. 374

$$\log_b N = e$$

$$\hookrightarrow b^e = N$$

a) $\log_7 49 = x$

$$7^x = 49$$

$$x = 2$$

b) $\log_6 1 = x$

$$6^x = 1$$

$$x = 0$$

c) $\log 0.001$

calculator
= -3

$$\log_{10} \frac{1}{1000} = x$$

$$10^x = \frac{1}{1000}$$

$$10^x = 1000^{-1}$$

$$10^x = (10^3)^{-1}$$

$$x = -3$$

d) $\log_2 \sqrt{8} = y$

$$2^y = \sqrt{8}$$

$$2^y = 8^{1/2}$$

$$2^y = (2^3)^{1/2}$$

$$2^y = 2^{3/2}$$

$$y = 3/2$$

Ex. 2 pg. 375

a) $\log_5 x = -3$

$$5^{-3} = x$$

$$\frac{1}{125} = x$$

b) $\log_x 36 = 2$

$$x^2 = 36$$

$$x = \pm \sqrt{36}$$

$$x = \pm 6$$

* can't have negative

$$\boxed{x = 6}$$

$\log_b N = e$
 ↑
 only one
 allowed
 negative

c) $\log_{64} x = \frac{2}{3}$

$$64^{2/3} = x$$

$$\sqrt[3]{64^2} = x$$

$$4^2 = x$$

$$16 = x$$

pg. 381

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