#6 $x = 1 - 4i$

$(x-1)^2 - (-4i)^2$

$(x-1)(x-1) = 16i^2 = 16(-1)$

$x^2 - 2x + 1 = -16$

$x^2 - 2x + 17 = 0$

factor

$x = 2 \rightarrow x - 2 = 0$

$y = (x-2)(x^2-2x+17)$

$y = x^3 - 2x^2 + 17x - 2x^2 + 4x - 34$

$y = x^3 - 4x^2 + 21x - 34$

#5d $y = \dfrac{4+1x^3}{2-x^2=1x^3}$

N.V.A. $y=-1$

#9d $(1+i)^4 = \underbrace{(1+i)(1+i)}\underbrace{(1+i)(1+i)}$

$= (1+2i+i^2)(1+2i+i^2)$

$= (2i)(2i)$

$= 4i^2$

$= -4$

#5g $f(x) = \dfrac{x^4}{x^2+x+1}$ NVA $y = x^2 - x$

$$x^2 - x + \frac{x}{x^2+x+1}$$

$$x^2+x+1 \;\overline{)\; x^4}$$

$$-x^4 - x^3 - x^2$$

$$-x^3 - x^2$$

$$+x^3 + x^2 + x$$

$$x$$

2nd degree ↑

← 1st degree

Exponential & Logarithmic Functions

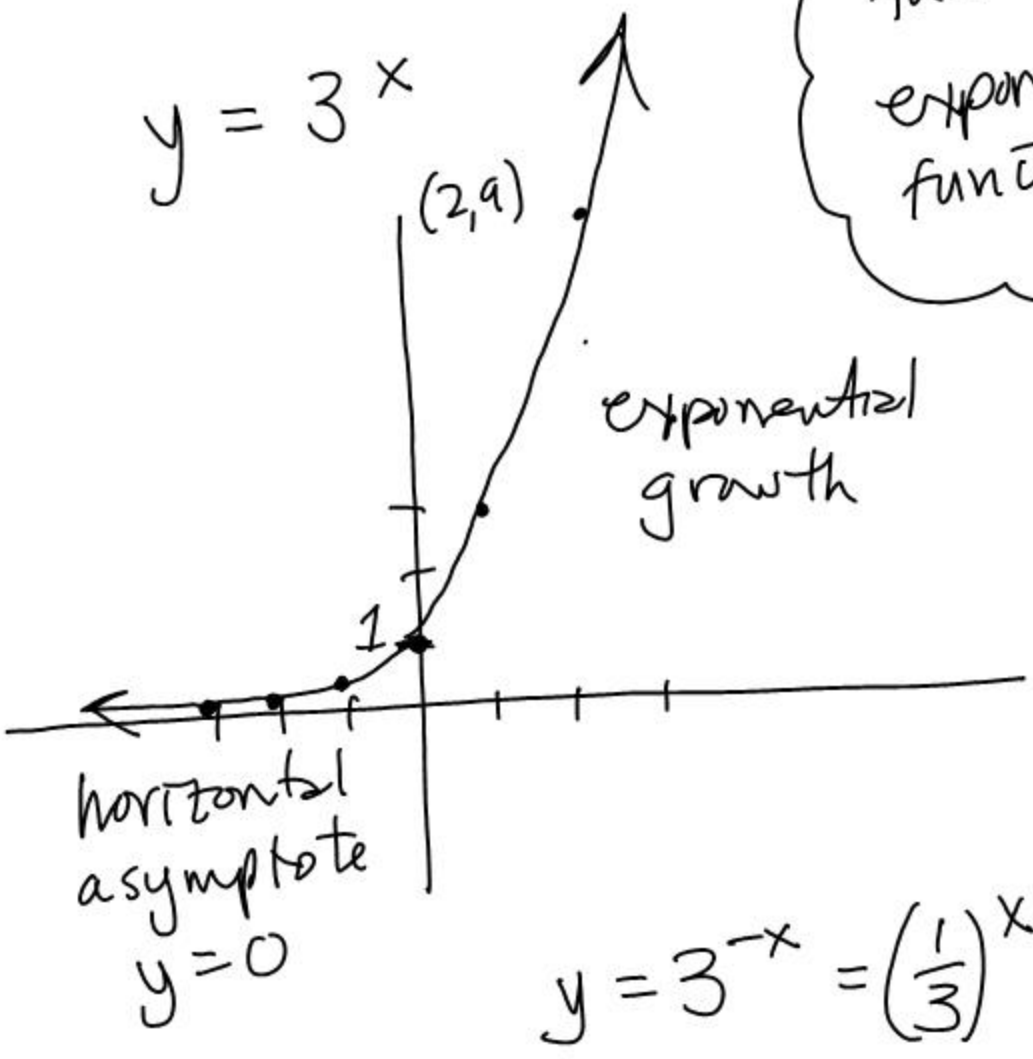
$y = a \cdot b^x$ ← variable in the exponent

base

power function $y = x^3$

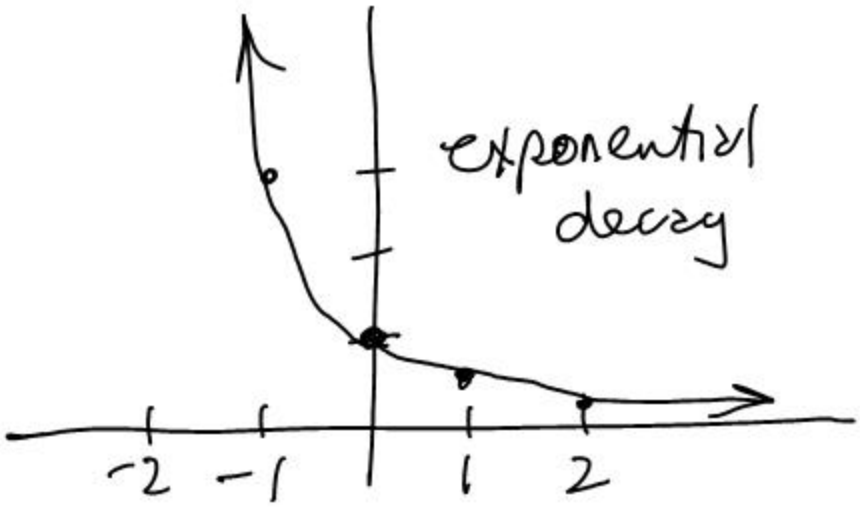
exponential function $y = 3^x$

$y = 3^x$



x	3^x
-3	1/27
-2	1/9
-1	1/3
0	1
1	3
2	9
3	27

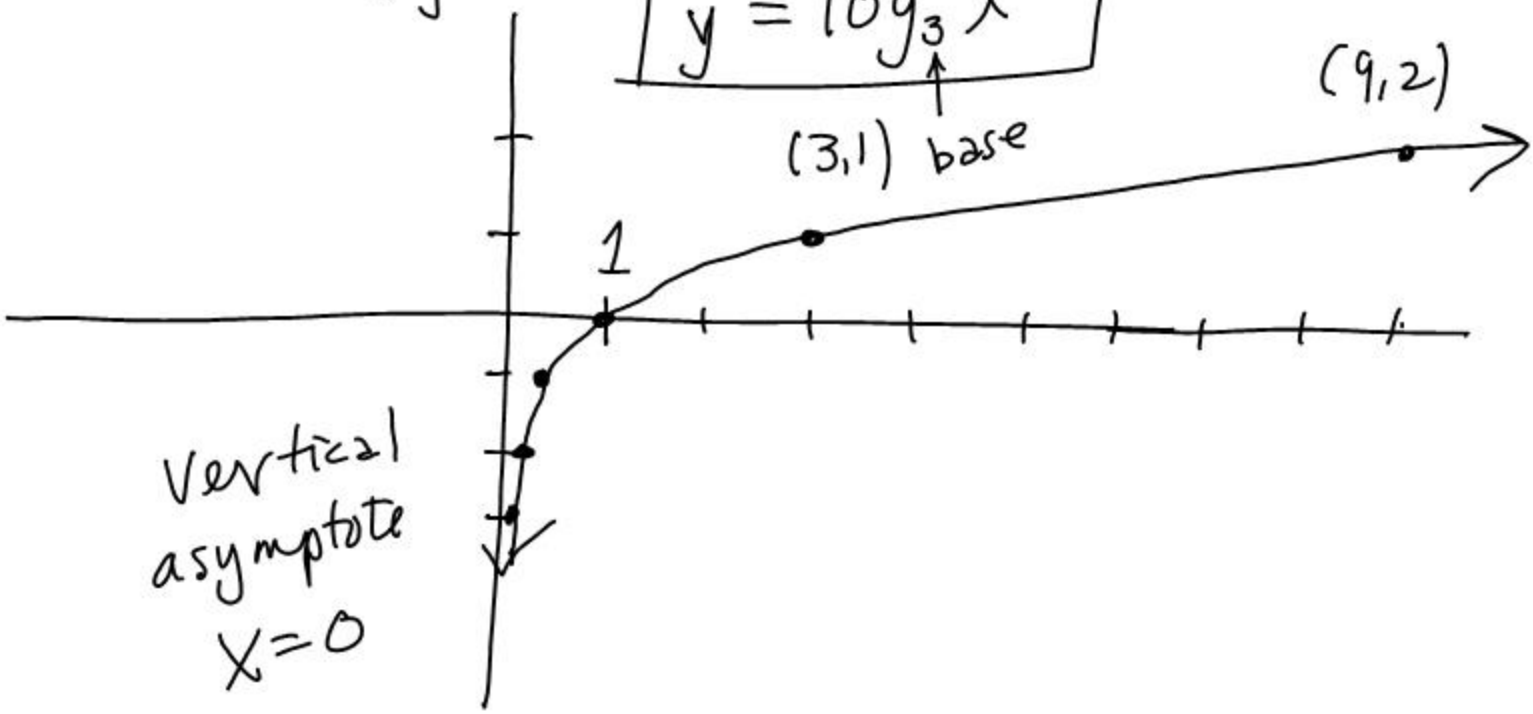
$y = 3^{-x} = \left(\frac{1}{3}\right)^x$



The inverse of $y = 3^x$

logarithm → $y = \log_3 x$ ← argument

$\log_3$ ← base



Ex. $\log_3 \sqrt{3} = \boxed{\frac{1}{2}}$

$3^{\square} = \sqrt{3}$ (log)

3 ← base

$\log_3 81 = \boxed{4}$

$3^{\square} = 81$

Ex. $\log_4 8 = \boxed{\frac{3}{2}}$

$4^{\square} = 8$

$2^{2\square} = 2^3$

The Natural Logarithm

$$\ln x = \log_e x$$

The Euler Number: $e \approx 2.718$

① $$e = \lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n$$

②

③