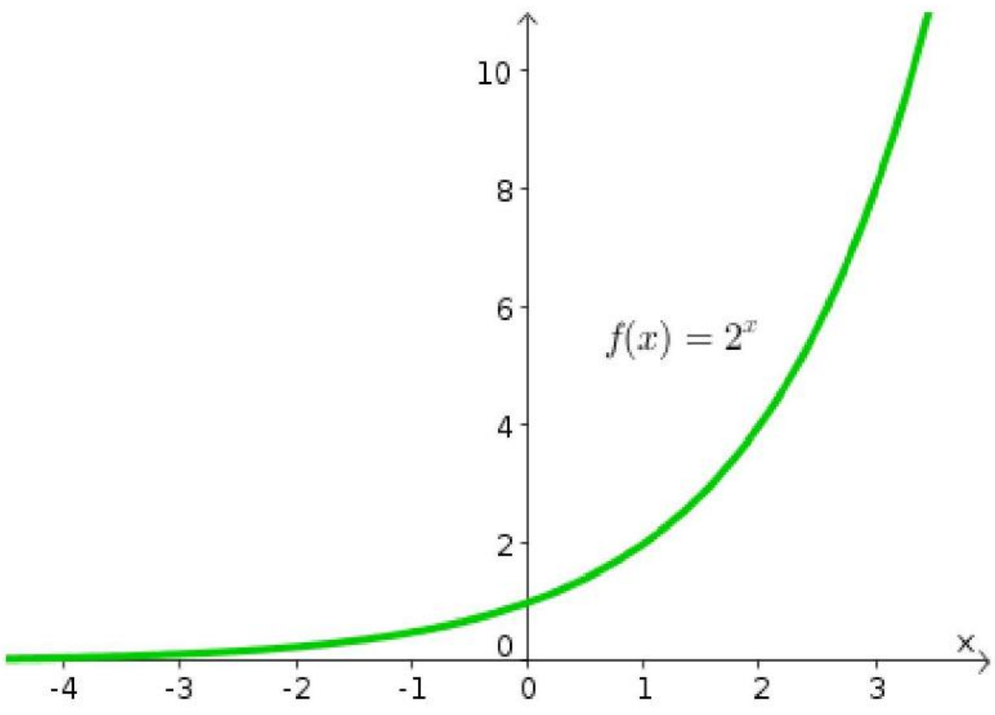
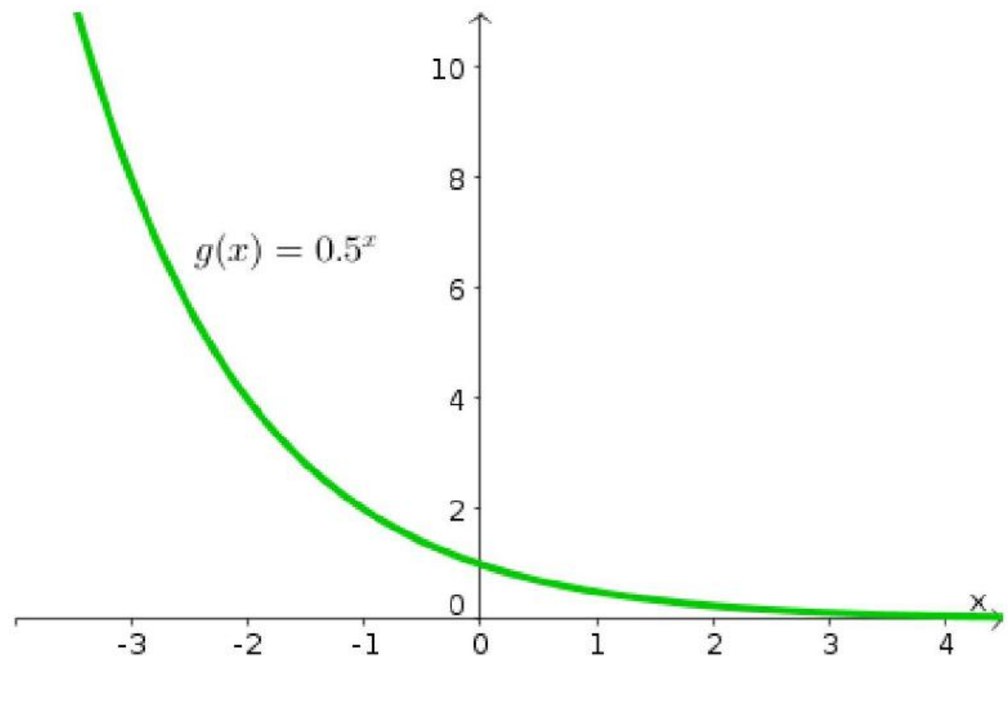
LOGARITHMS

Exponential Function

- $y = a^x$
- a>1

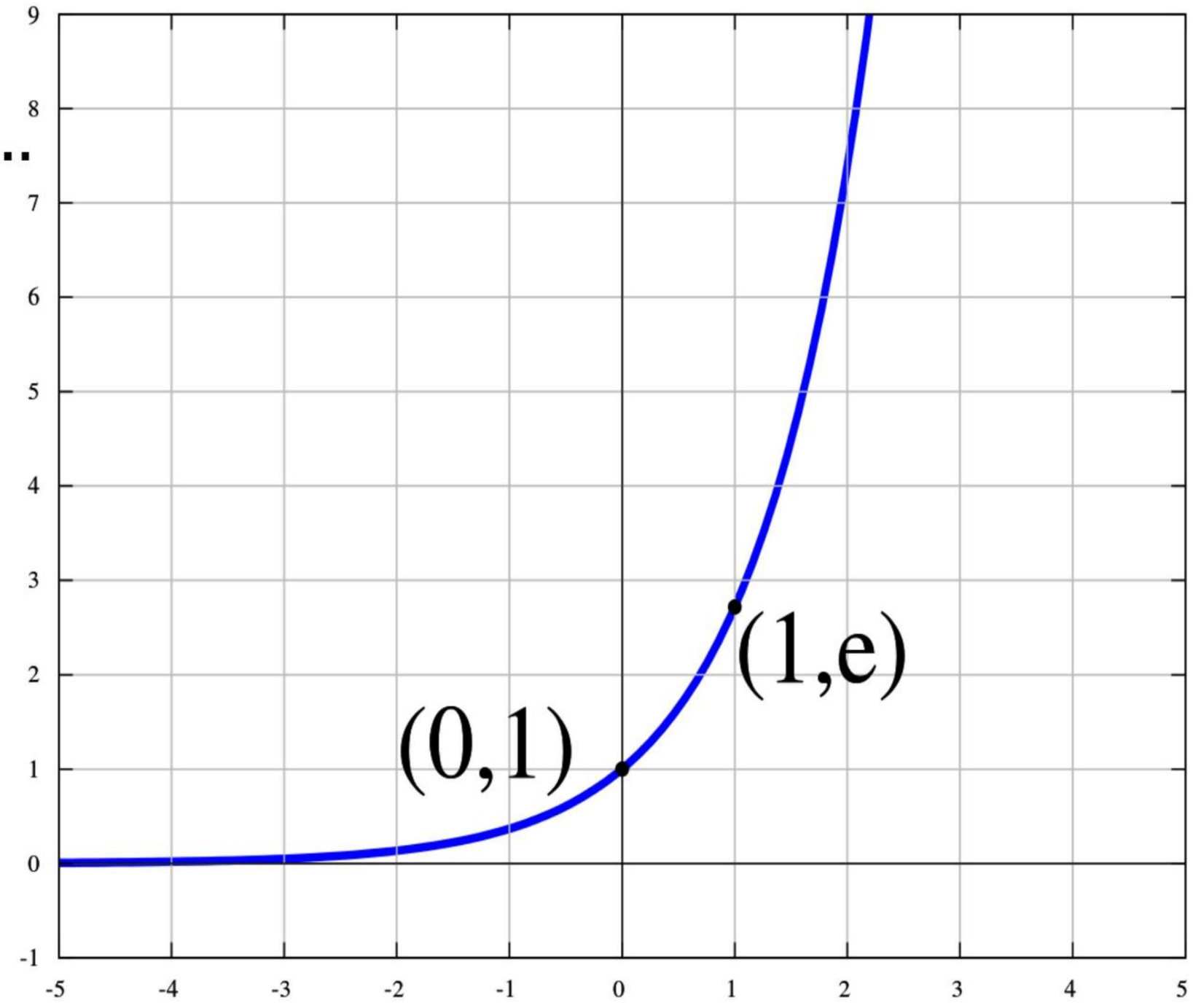


a<1



Natural Exponential Function

- $y = e^x$
- $e = 2.718281 \ldots$



Logarithms

- $x^n = b$, *can be written as,*
- $\log_x b = n$
- Logarithm to base ‘x’ of ‘b’ is ‘n’.

Common logarithm..?

Natural logarithm..?

Exponential Form $\Longleftrightarrow$ Logarithmic Form

- **Express in logarithmic form**

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

b) $27^{\frac{2}{3}} = 9$

c) $4^5 = 1024$

- **Express in exponential form**

d) $\log_7 49 = 2$

e) $\log_4 2 = \frac{1}{2}$

f) $\log_8 \sqrt{8} = \frac{1}{2}$

Evaluate logarithm

- Use $\log_b b^x = x$
- Find without using calculators,

a) $\log_2 8$

b) $\log_3 27$

c) $\log_3(\frac{1}{81})$

d) $\log_8 \sqrt{8}$

e) $\log_t 1$

Laws of Logarithms

- *Logarithm of Products*
- *Logarithm of Quotient*
- *Logarithm of Power Functions*

Express each of the following as a single logarithm

a) $\log 8 + \log 9$

b) $\log 11 + \frac{1}{2}\log 36 \ + \log 3 \log 9$

c) $\frac{1}{3}\log 8 - 2\log 12$

d) $\log 200 + \log 1 \ - \log 2$

Changing the base..!!

- $\log_a x = \log_b x \,/\, \log_b a$

- Show that $\log_x b = 1/\log_{\mathrm{b}} x$

The End….!!!