

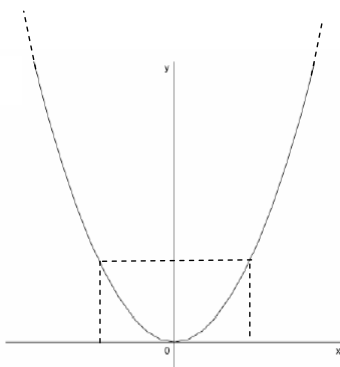
Limiti di funzioni elementari.



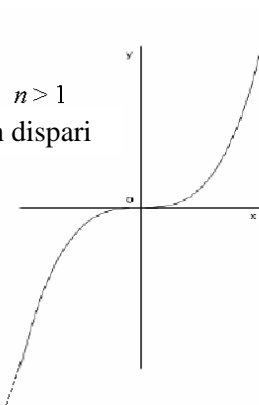
23. Limiti di funzioni elementari.

Funzione potenza ad esponente intero

n pari



$n > 1$
 n dispari

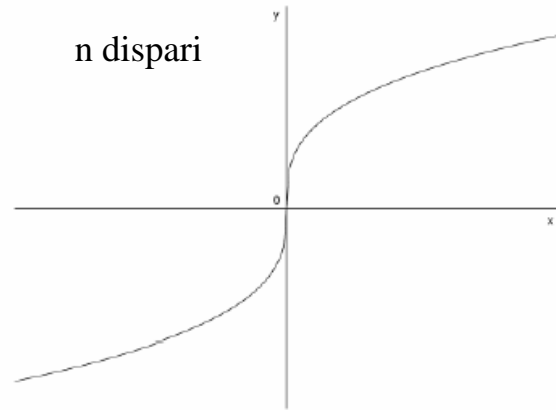
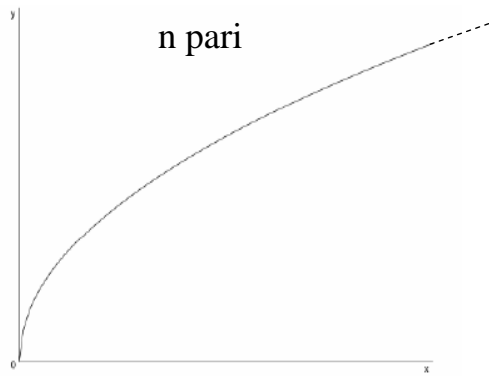


- $\lim_{x \rightarrow +\infty} x^n = +\infty, \forall n \in \mathbb{N}$
- n pari $\lim_{x \rightarrow -\infty} x^n = +\infty$
- n dispari $\lim_{x \rightarrow -\infty} x^n = -\infty$



23. Limiti di funzioni elementari.

Funzione radice ennesima



- $\lim_{x \rightarrow +\infty} \sqrt[n]{x} = +\infty, \forall n \in \mathbb{N}$

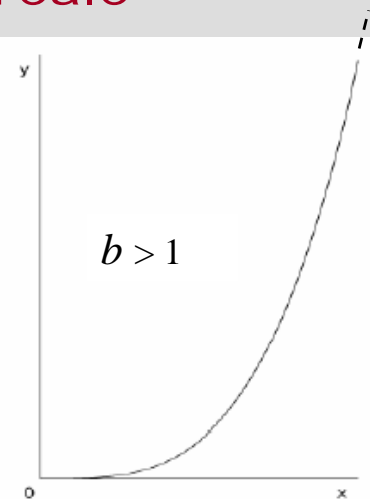
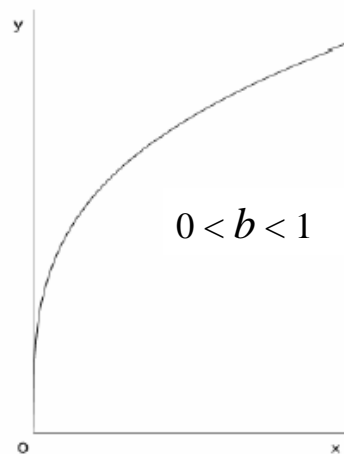
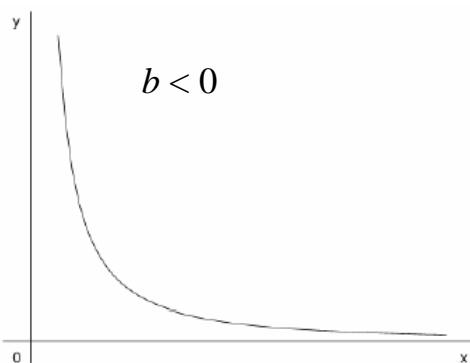
- $n \text{ pari} \quad \nexists \lim_{x \rightarrow -\infty} \sqrt[n]{x}$

- $n \text{ dispari} \quad \lim_{x \rightarrow -\infty} \sqrt[n]{x} = -\infty$



23. Limiti di funzioni elementari.

Funzione potenza ad esponente reale



- $\lim_{x \rightarrow +\infty} x^b = 0$

- $\lim_{x \rightarrow +\infty} x^b = +\infty$

- $\lim_{x \rightarrow +\infty} x^b = +\infty$

- $\lim_{x \rightarrow 0^+} x^b = +\infty$

- $\lim_{x \rightarrow 0} x^b = 0$

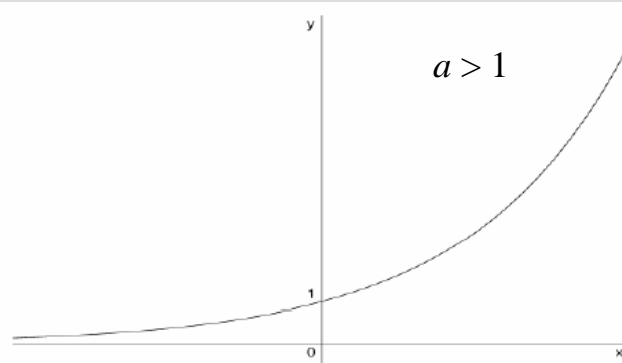
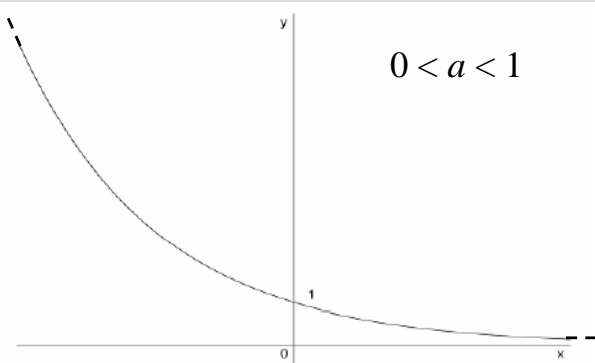
- $\lim_{x \rightarrow 0} x^b = 0$

(Continuità in zero)



23. Limiti di funzioni elementari.

Funzione esponenziale



- $\lim_{x \rightarrow +\infty} a^x = 0$

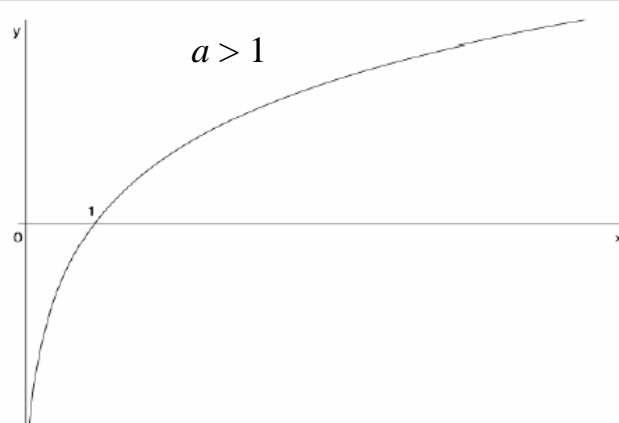
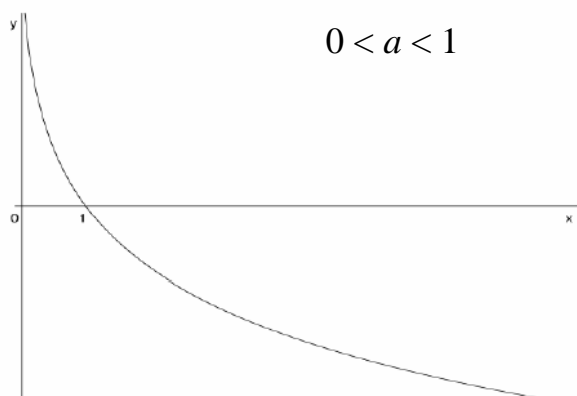
- $\lim_{x \rightarrow +\infty} a^x = +\infty$

- $\lim_{x \rightarrow -\infty} a^x = +\infty$

- $\lim_{x \rightarrow -\infty} a^x = 0$



Funzione logaritmo



- $\lim_{x \rightarrow +\infty} \log_a x = -\infty$

- $\lim_{x \rightarrow +\infty} \log_a x = +\infty$

- $\lim_{x \rightarrow 0^+} \log_a x = +\infty$

- $\lim_{x \rightarrow 0^+} \log_a x = -\infty$



Funzione seno/coseno

- $\lim_{x \rightarrow \pm\infty} \sin x$ *non esiste*

- $\lim_{x \rightarrow \pm\infty} \cos x$ *non esiste*

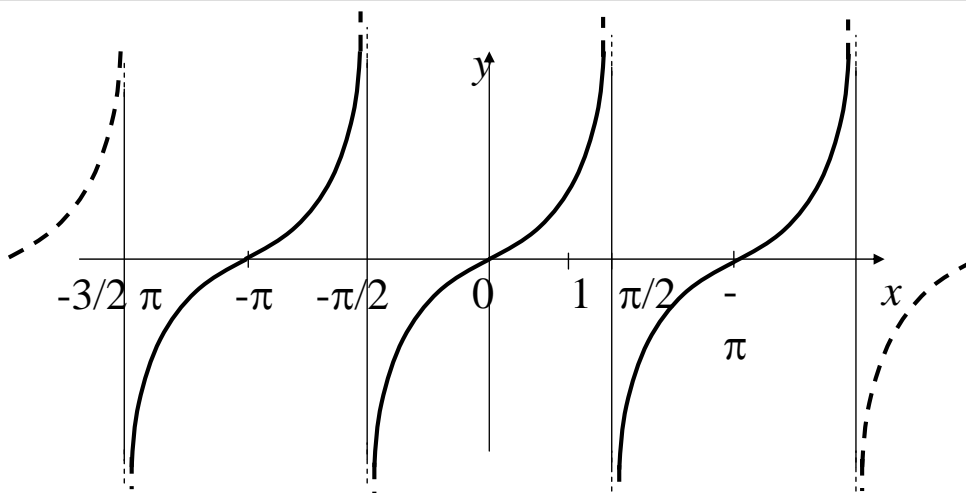


Pur non esistendo, tali limiti rappresentano qualcosa di limitato (finito) poiché sia la funzione seno che la funzione coseno assumono valori nell'intervallo chiuso e limitato $[-1, 1]$



23. Limiti di funzioni elementari.

Funzione tangente



- $\lim_{x \rightarrow \pm\infty} \tan x$ *non esiste*

- $\lim_{x \rightarrow \frac{\pi^-}{2}} \tan x = +\infty$

- $\lim_{x \rightarrow \frac{\pi^+}{2}} \tan x = -\infty$



23. Limiti di funzioni elementari.