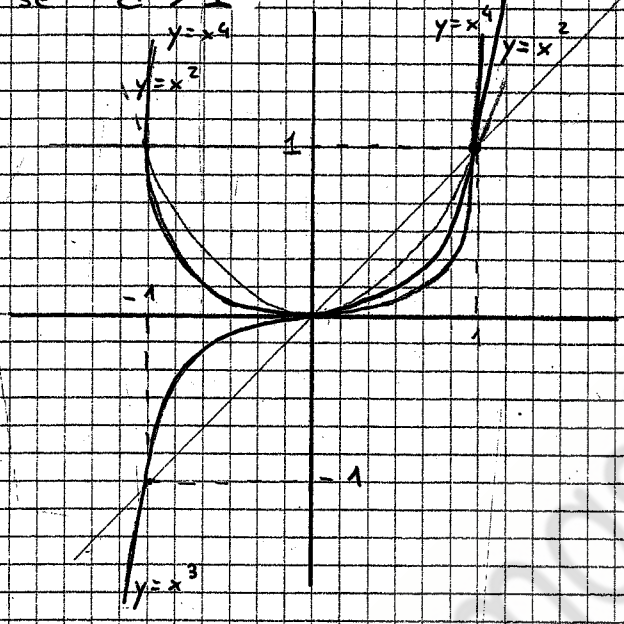
Ripasso

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funzioni potenza $y = x^a$

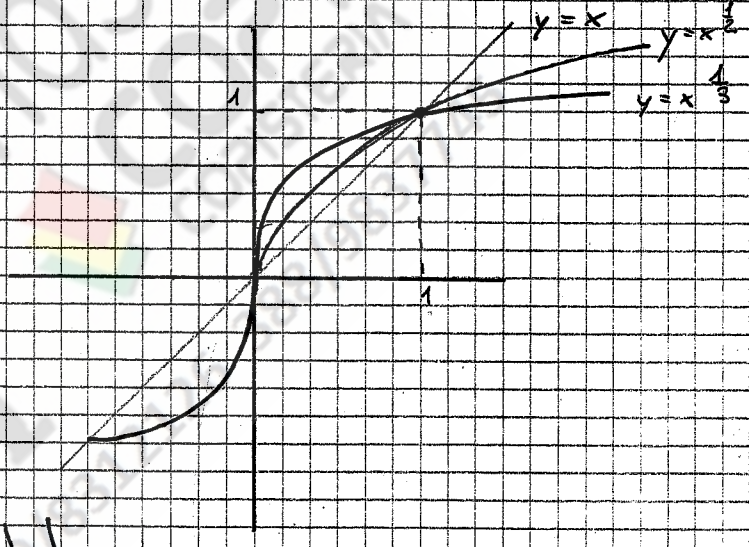
se $a > 1$



$x^0 = 1 \rightarrow y = 1$

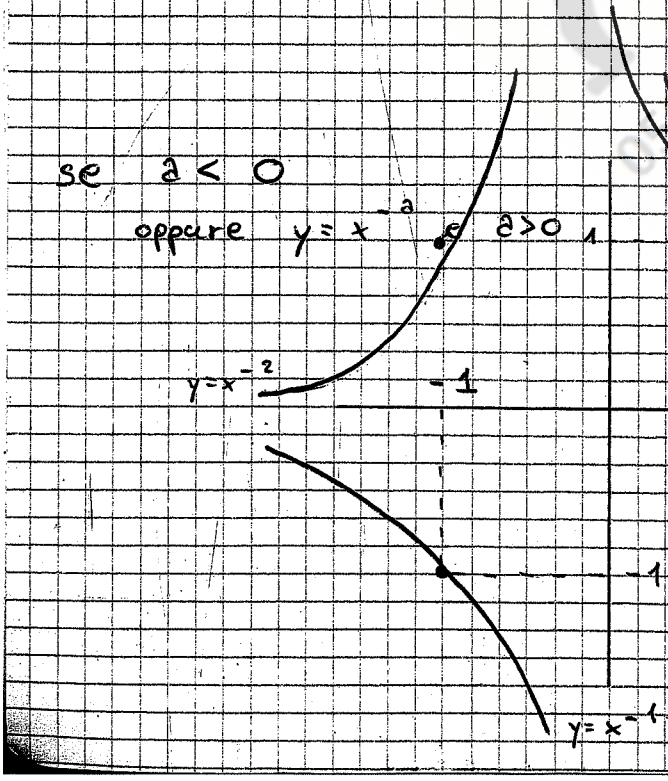
tutte le curve passano per (1,1)

se $0 < a < 1$



se $a < 0$

oppure $y = x^{-a}$ e $a > 0$



$y = x^{-1}$ (esponente dispari neg.)

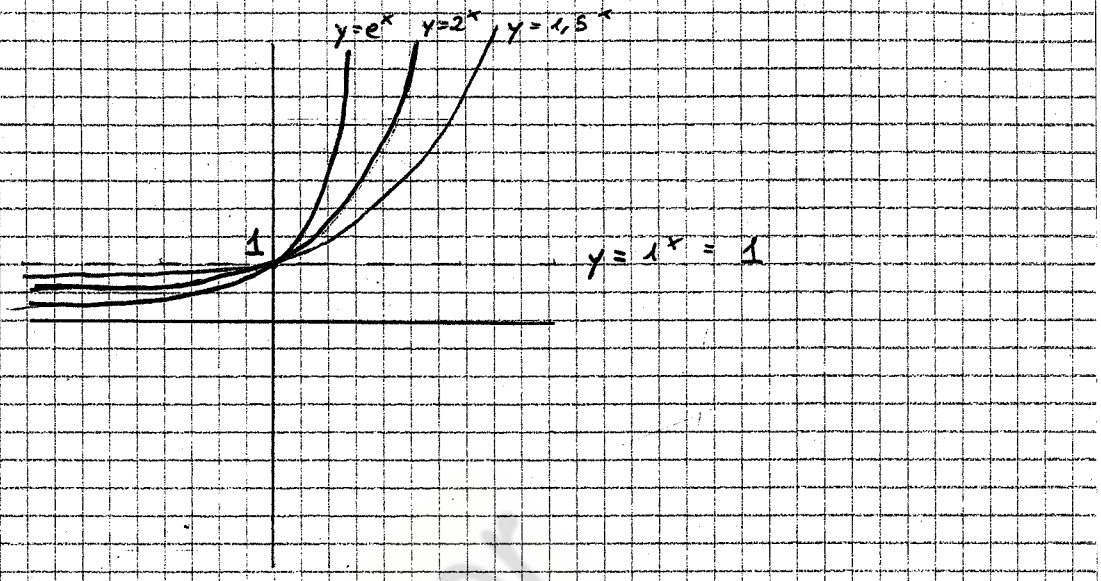
ES: $y = x^{-1}$

↓

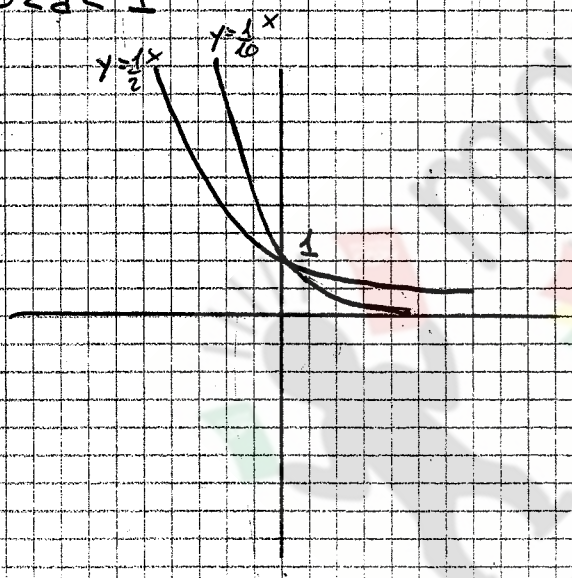
si fa simmetria rispetto l'origine

funzioni esponenziali $y = a^x$

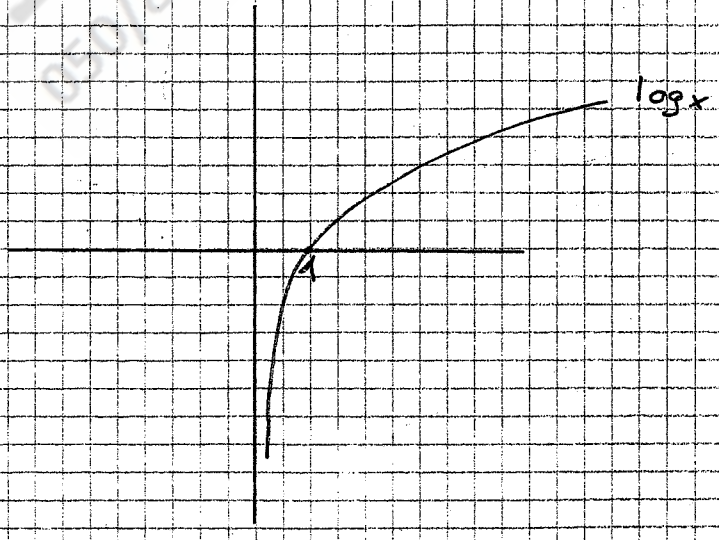
$a > 0$



$0 < a < 1$



logaritmo



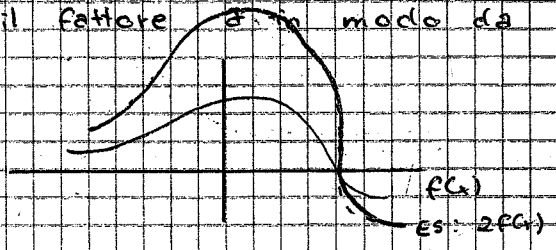
traslazione dei grafici

- $f(x-c)$: traslazione verso destra asse x
- $f(x+c)$: traslazione verso sinistra asse x
- $a \cdot f(x)$: moltiplico $f(x)$ · il fattore a in modo da dilatare la f

se $a > 1$

↓

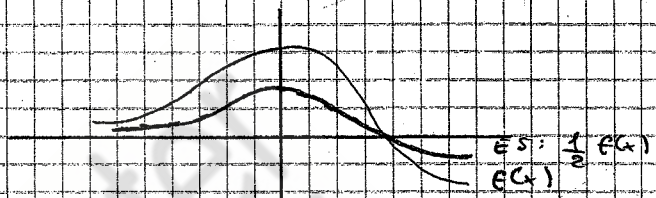
dilatazione verticale



se $0 < a < 1$

↓

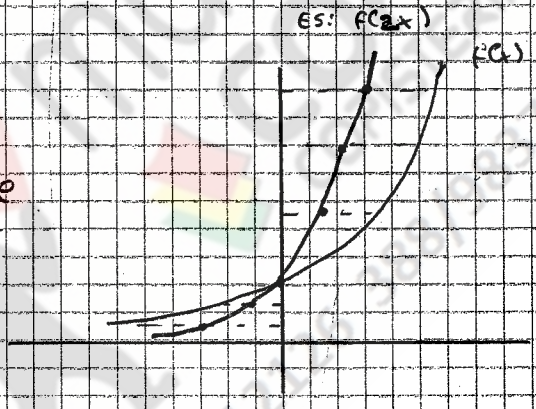
compressione verticale



- $f(ax)$ se $a > 1$

↓

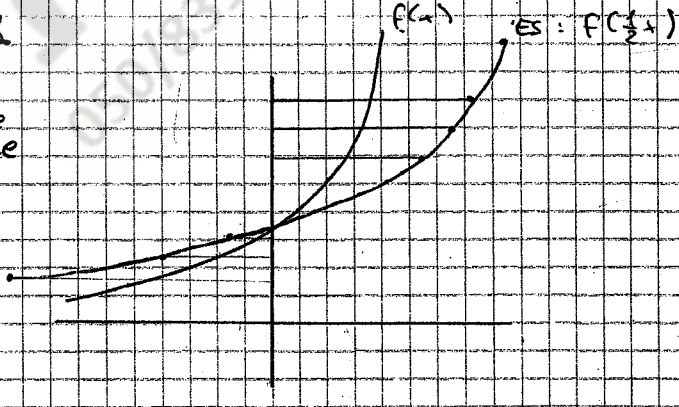
compressione orizzontale



se $0 < a < 1$

↓

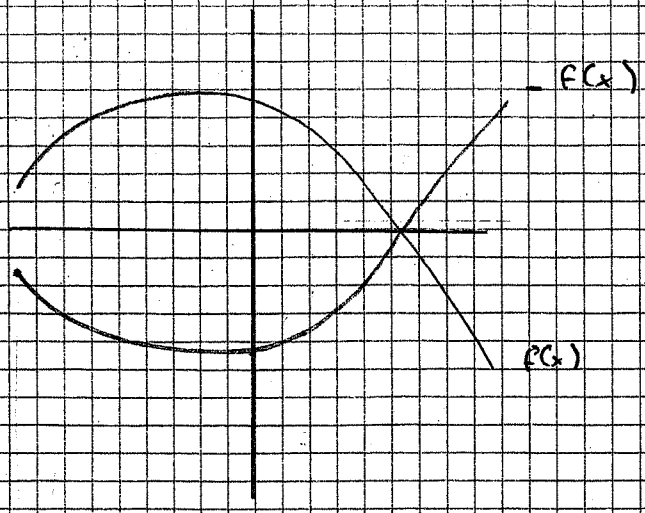
dilatazione orizzontale



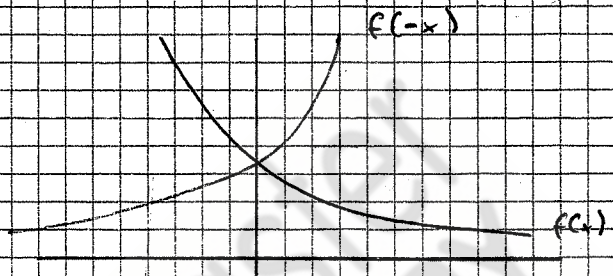
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$-f(x)$



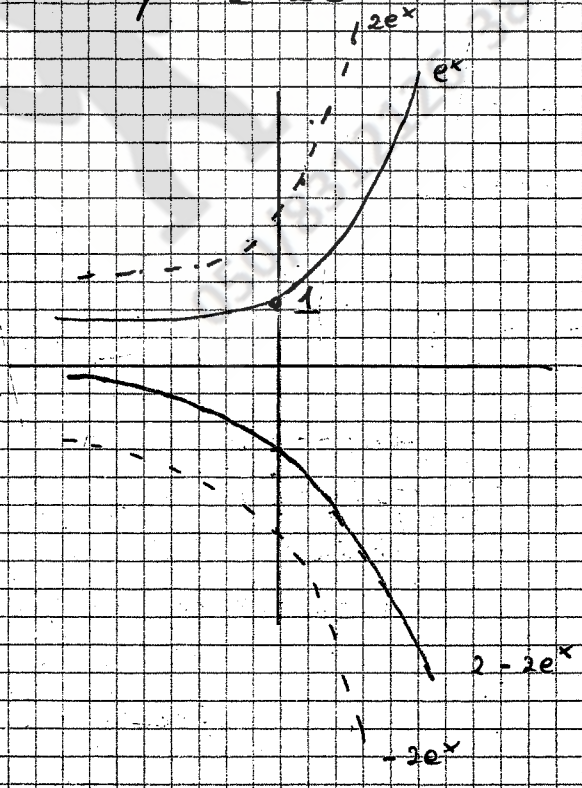
$f(-x)$



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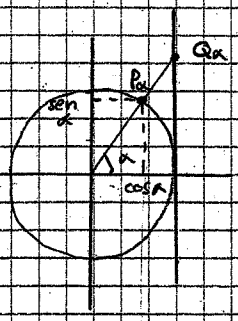
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ESEMPIO $y = 2 - 2e^x$



e^x
↓
$2e^x$
↓
$-2e^x$
↓
$-2e^x + 2$

trigonometria



dato un angolo α si costruisce:

- P_α ($\cos\alpha$, $\sin\alpha$)
- Q_α (1, $\tan\alpha$)

α può essere un qualunque numero $\in \mathbb{R}^+$

- $\sin\alpha$ e $\cos\alpha$ definiti per $\alpha \in \mathbb{R}$
- $\tan\alpha$ è definita per $\alpha \neq \frac{\pi}{2} + k\pi$ con $k \in \mathbb{Z}$ (insieme num. interi +, -)

α	$\sin\alpha$	$\cos\alpha$	$\tan\alpha$
0	0	1	0
$\frac{\pi}{6}$	$\frac{1}{2}$	$\sqrt{3}/2$	$\sqrt{3}/3$
$\frac{\pi}{4}$	$\sqrt{2}/2$	$\sqrt{2}/2$	1
$\frac{\pi}{3}$	$\sqrt{3}/2$	$\frac{1}{2}$	$\sqrt{3}$
$\frac{\pi}{2}$	1	0	non definita
π	0	-1	0
$\frac{3}{2}\pi$	-1	0	non definita

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RELAZIONI FONDAMENTALI

$\sin^2\alpha + \cos^2\alpha = 1$

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha}$

$\sin(-\alpha) = -\sin\alpha$

$\cos(-\alpha) = \cos\alpha$

$\tan(-\alpha) = -\tan\alpha$

$\sin\alpha = \cos(\frac{\pi}{2} - \alpha)$

$\cos\alpha = \sin(\frac{\pi}{2} - \alpha)$

$\sin(\alpha \pm \beta) = \sin\alpha \cdot \cos\beta \pm \cos\alpha \cdot \sin\beta$

$\cos(\alpha \pm \beta) = \cos\alpha \cdot \sin\beta \mp \sin\alpha \cdot \cos\beta$

$\sin 2\alpha = 2\sin\alpha \cdot \cos\alpha$

$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$

$= 1 - 2\sin^2\alpha$

$= 2\cos^2\alpha - 1$