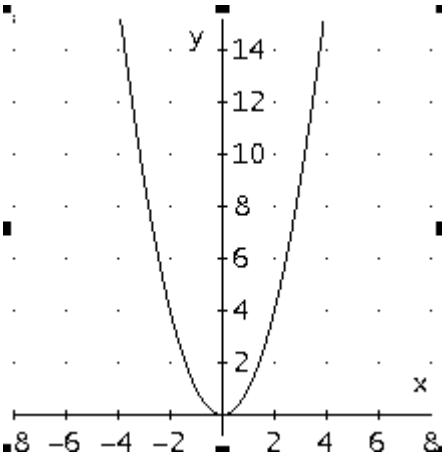
"LE CURVE CELEBRI" - LUCIANO CRESCI
interpretazione con Derive 5 a cura di Maria Teresa Bianchi

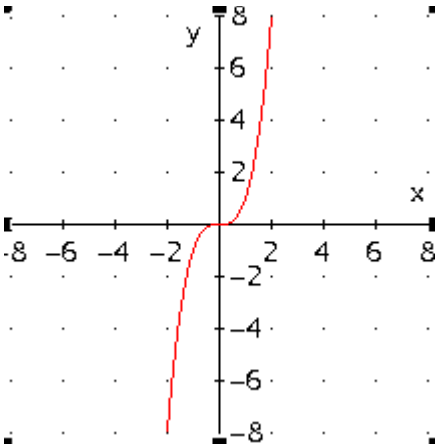
1 . PARABOLA

$y = x^2$



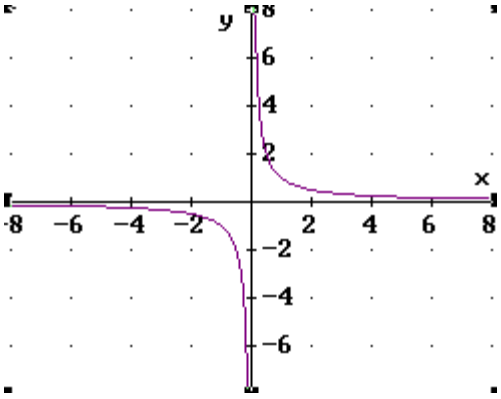
2 . PARABOLA CUBICA

$y=x^3$



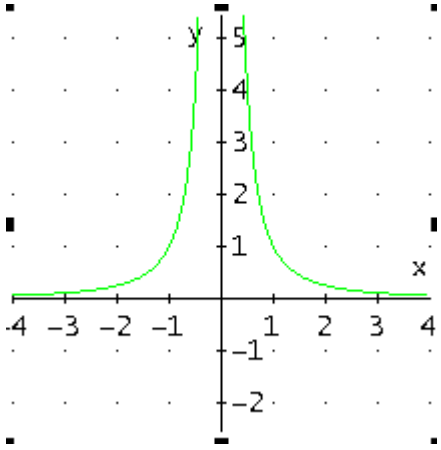
3 . IPERBOLE EQUILATERA

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



4 . FUNZIONE PARI

$$y = \frac{1}{x^2}$$

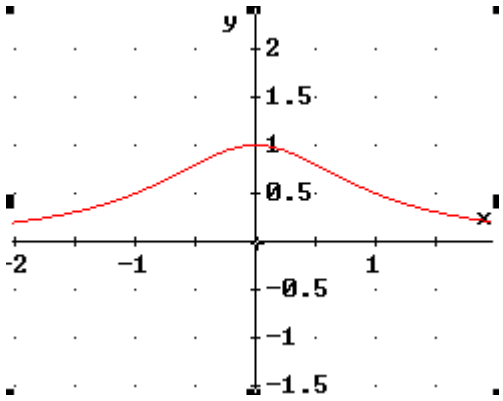


5 . LA VERSIERA DI GAETANA AGNESI (1718-1799) o AGNESIANA

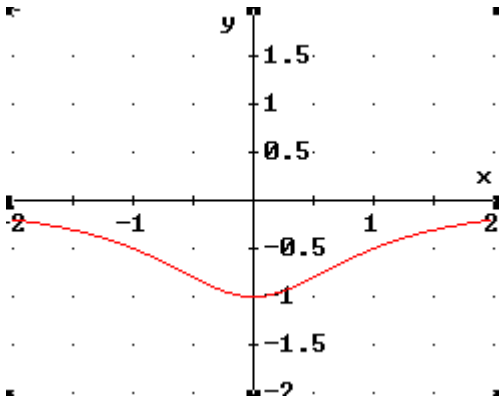
$$(a^2 + x^2)\, y = a^3$$

$$y = \frac{a^3}{a^2 + x^2}$$

a=1

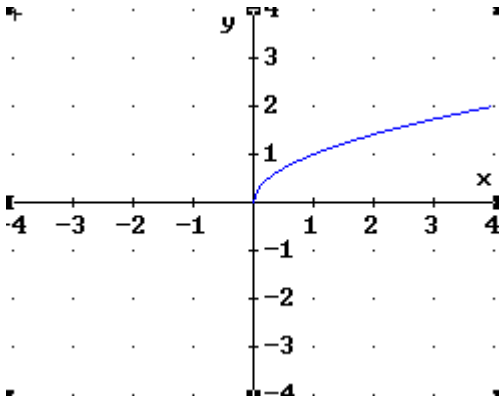


a=-1



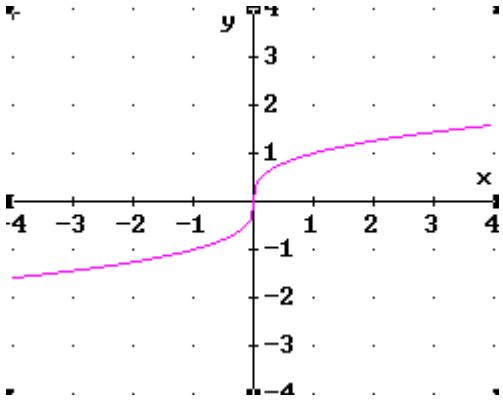
6 . PARABOLA (RAMO SUPERIORE)

$y = \sqrt{x}$



7. PARABOLA CUBICA

$y = x^{1/3}$

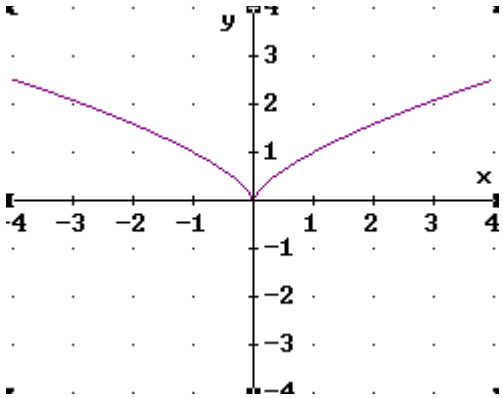


8a . PARABOLA DI WILLIAM NEILE (1637-1670)

$y = x^{2/3}$

oppure in forma parametrica:

$x = t^3$
$y = t^2$



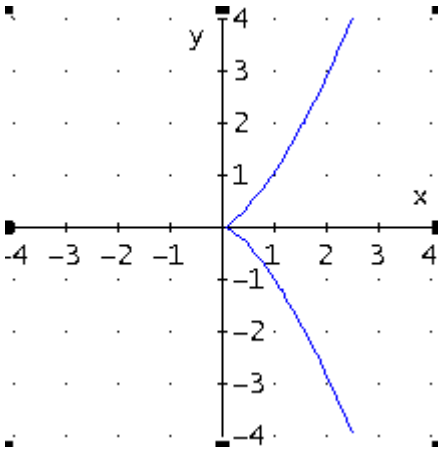
La curva presenta una cuspide in O.

8b. PARABOLA DI WILLIAM NEILE (1637-1670) - parabola semicubica

$y^2 = x^3$

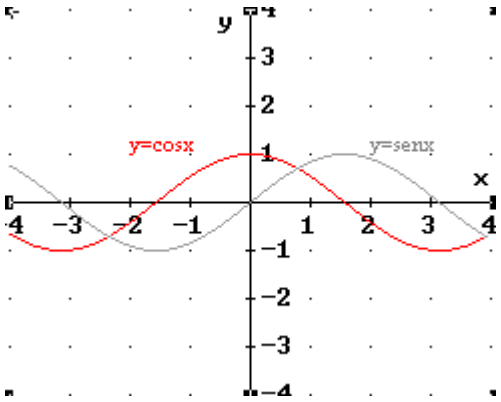
oppure in forma parametrica:

$x = t^2$
$y = t^3$



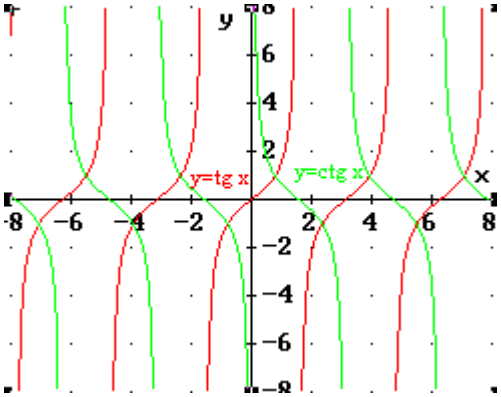
9. SINUSOIDE E COSINUSOIDE

y = SIN(x)
y = COS(x)



10 . TANGENTOIDE E COTANGENTOIDE

y = TAN(x)
y = COT(x)



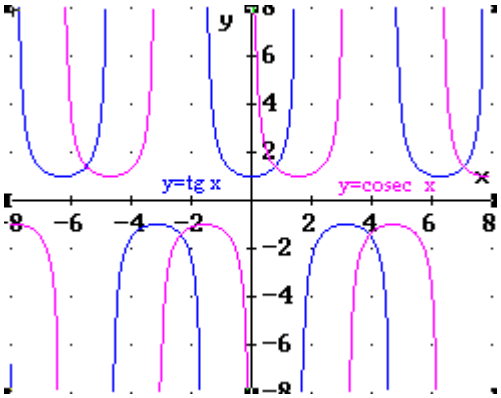
11. SECANTE E COSECANTE

$$y = SEC(x)$$

$$y = \frac{1}{COS(x)}$$

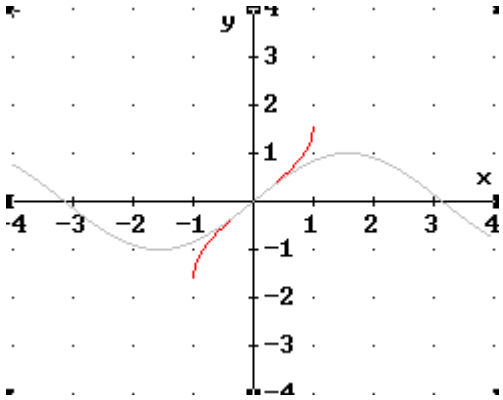
$$y = CSC(x)$$

$$y = \frac{1}{SIN(x)}$$

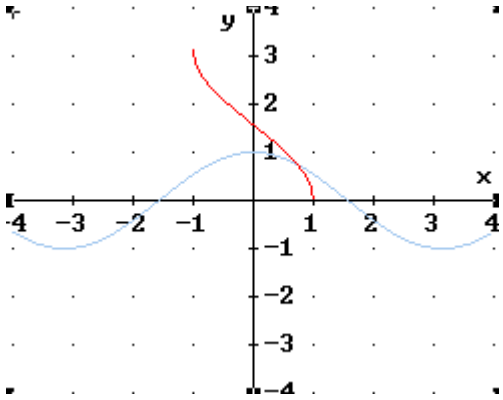


12 - 13. FUNZIONI GONIOMETRICHE INVERSE

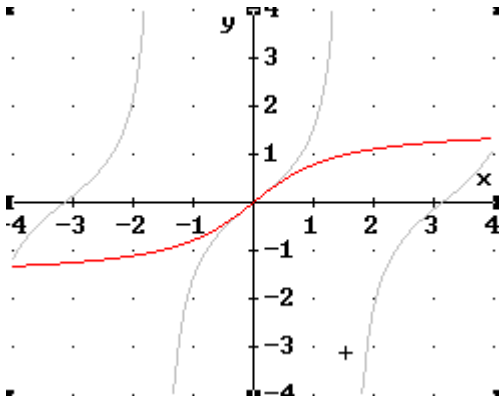
y = ASIN(x)
y = SIN(x)



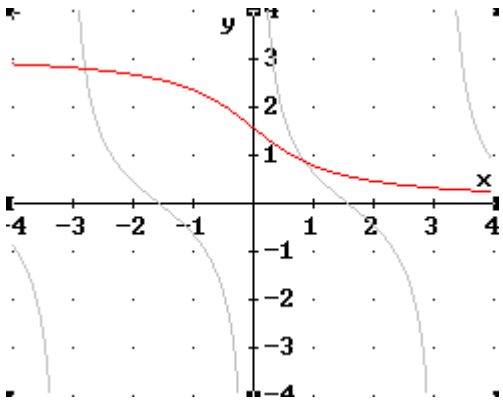
y = ACOS(x)
y = COS(x)



y = ATAN(x)
y = TAN(x)

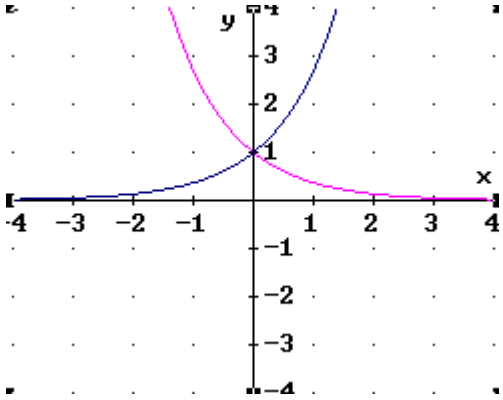


y = ACOT(x)
y = COT(x)



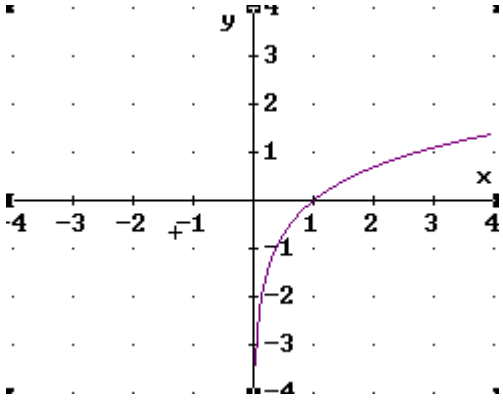
14. FUNZIONI ESPONENZIALI

$y = e^{x}$
$y = e^{-x}$



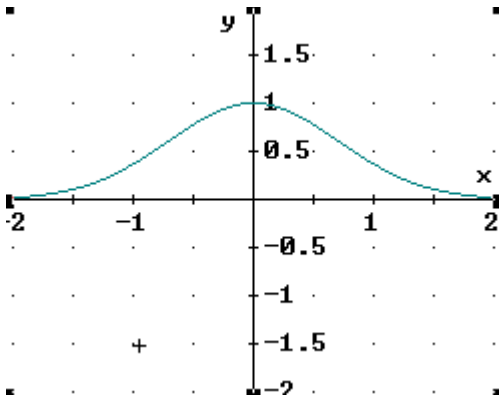
15. FUNZIONE LOGARITMICA IN BASE e

y = LN(x)



16. LA CURVA "A CAMPANA"

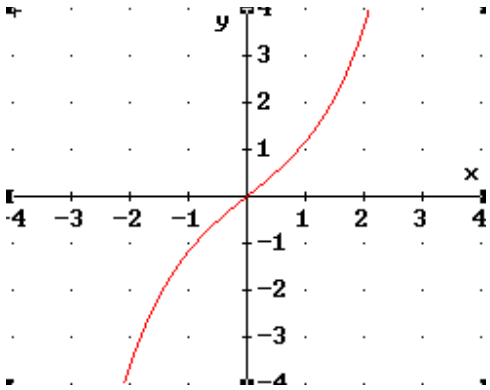
$y = e^{-x^2}$



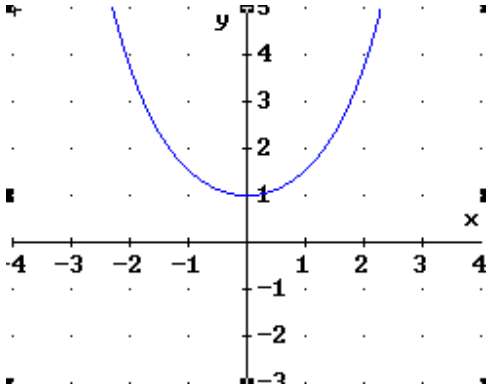
17-18. FUNZIONI IPERBOLICHE

SENO IPERBOLICO **COSENO IPERBOLICO** **TANGENTE IPERBOLICA** **COTANGENTE IPERBOLICA**

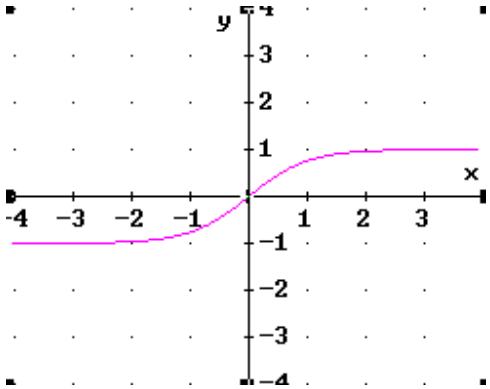
$$y = \mathrm{SINH}(x) = \frac{e^{x} - e^{-x}}{2}$$



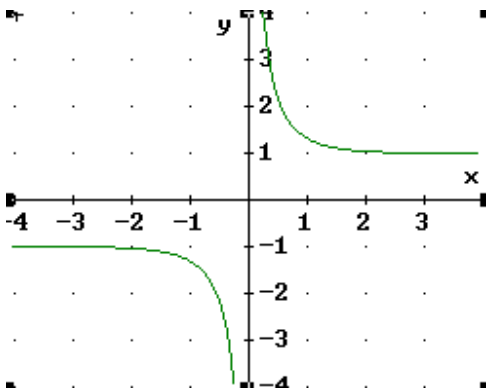
$$y = \mathrm{COSH}(x) = \frac{e^{x} + e^{-x}}{2}$$



$$y = \mathrm{TANH}(x) = \frac{e^{x} - e^{-x}}{e^{x} + e^{-x}}$$



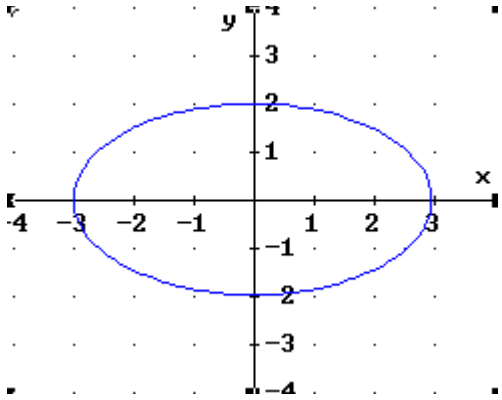
$$y = \mathrm{COTH}(x) = \frac{e^{x} + e^{-x}}{e^{x} - e^{-x}}$$



19. ELLISSE

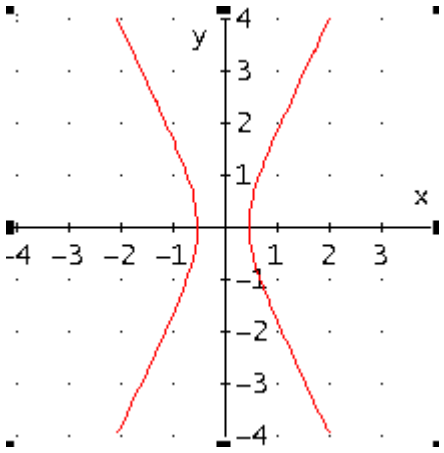
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

$x = a\,COS(t)$
$y = a\,SIN(t)$



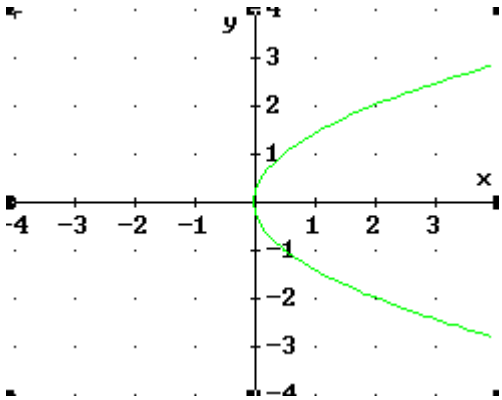
20. IPERBOLE

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$



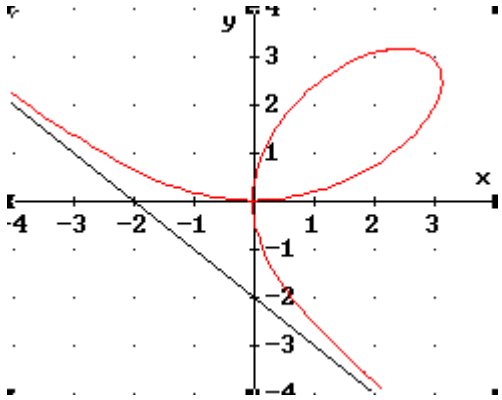
21. PARABOLA

$y^2 = 2px$



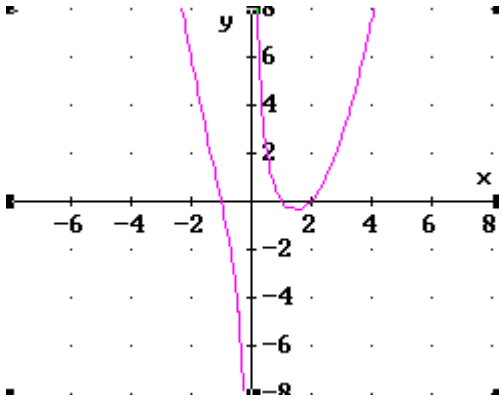
22. FOLIUM DI DESCARTES (CARTESIO 1596 - 1650) o CAPPIO

$x^3 + y^3 - 3axy = 0$
retta: $x + y + a = 0$



22a. PARABOLA CARTESIANA O TRIDENTE

$x^3 - 2ax^2 - a^2 x + 2a^3 = axy$

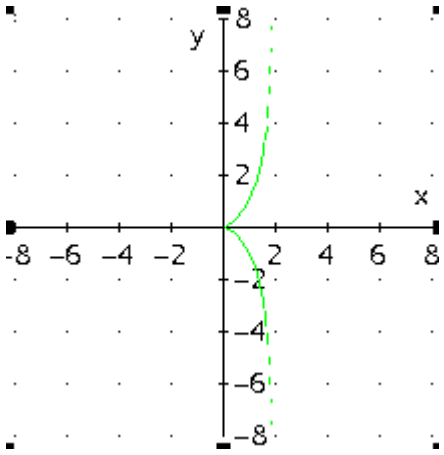


23. CISSOIDE DI DIOCLE (II° SEC a.C.)

$$y^2 = \frac{x^3}{a - x}$$

$$x = \frac{at^2}{1 + t^2}$$

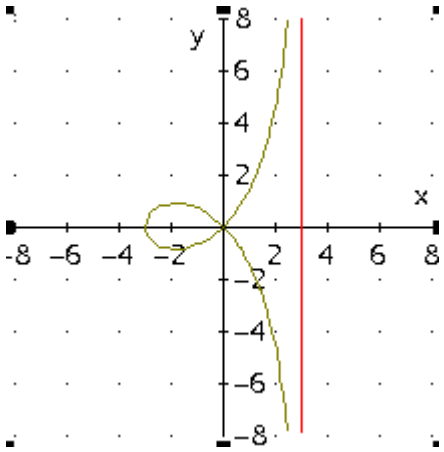
$$y = \frac{at^3}{1 + t^2}$$



24. STROFOIDE

$$y^2 = x^2 \frac{a + x}{a - x}$$

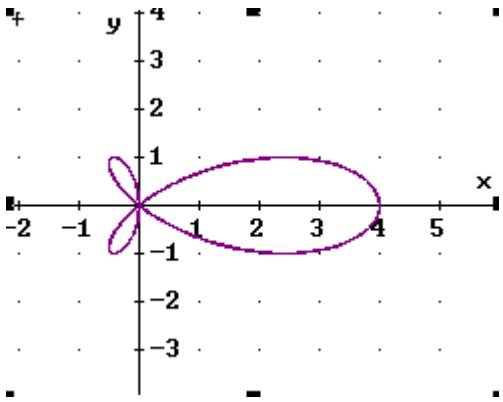
x = a



24a. STROFOIDE A TRE PETALI

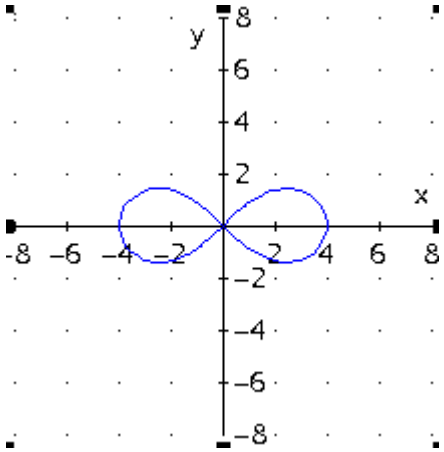
N.B. : Per poter tracciare con Derive curve espresse in coordinate polari, si deve impostare nel menu 2D tale sistema di coordinate:
Imposta - Sistema di coordinate - Polare
Al momento dell' inserimento del grafico si apre una finestra di dialogo che presenta il range di valori del parametro e due opzioni :grafico linea - grafico punti. Si stabilisce il range di valori e l'opzione e si traccia il grafico.

r = 4aCOS(2t) COS(t)



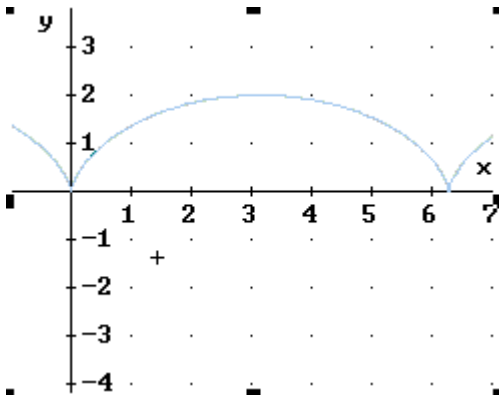
25. LEMNISCATA DI BERNOUILLE

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



26. CICLOIDE

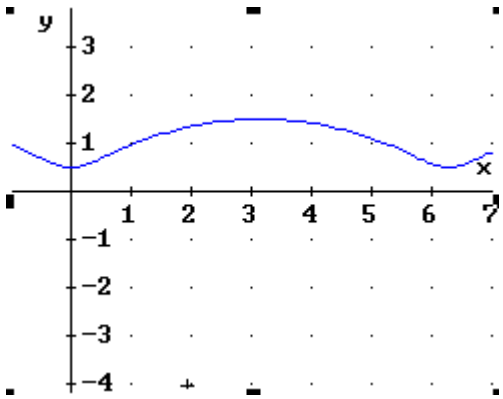
x = a(t - SIN(t))
y = a(1 - COS(t))



26a. CICLOIDE CURTATA

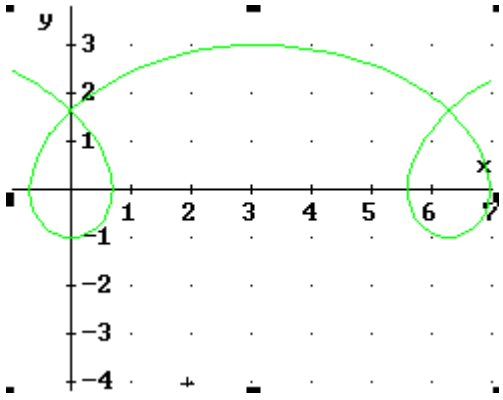
x = a(t - hSIN(t))
y = a(1 - hCOS(t))

a=1 e h=1/2



26b. CICLOIDE ALLUNGATA
X = a (t - h·SIN(t))
y = a (1 - hCOS(t))

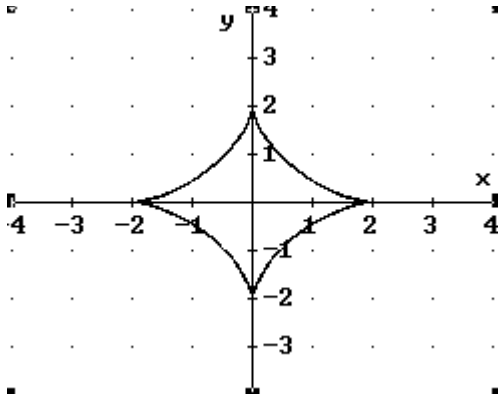
a=1 e h=2



27. IPOCICLOIDE o ASTROIDE

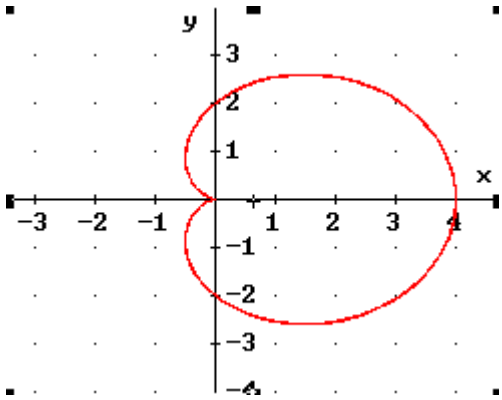
$x^{2/3} + y^{2/3} = a^{2/3}$

$x = a\,COS^3(t)$
$y = a\,SIN^3(t)$



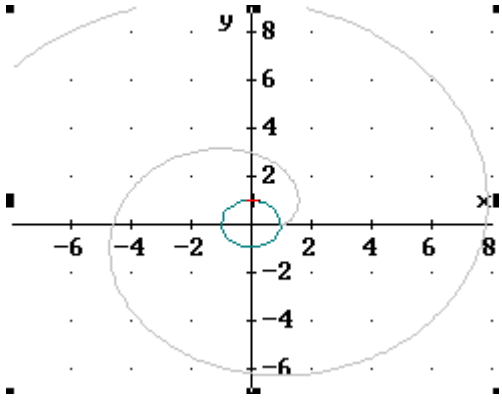
28. CARDIOIDE

$r = a\,(1 + COS(\varphi))$



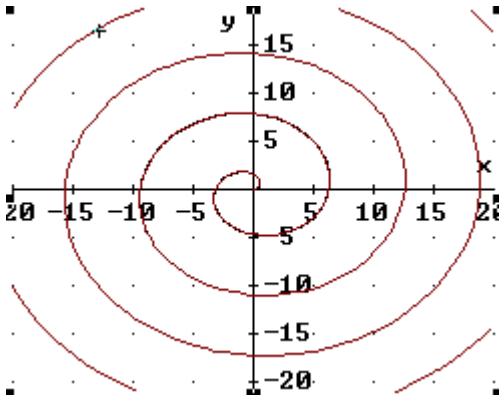
29. SPIRALE EVOLVENTE DELLA CIRCONFERENZA

$x = a\,(COS(t) + t\,SIN(t))$
$y = a\,(SIN(t) - t\,COS(t))$



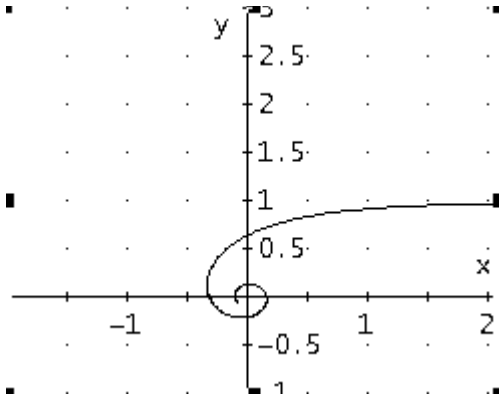
30. SPIRALE D' ARCHIMEDE (287-212 a.C.)

$r = a \cdot \varphi$



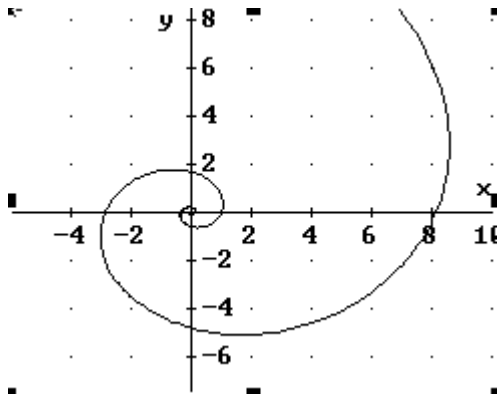
31. SPIRALE IPERBOLICA

$$r = \frac{a}{\varphi}$$



32. SPIRALE LOGARITMICA

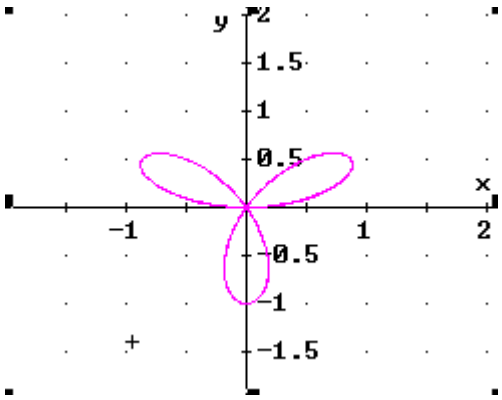
$r = e^{a \cdot \varphi}$



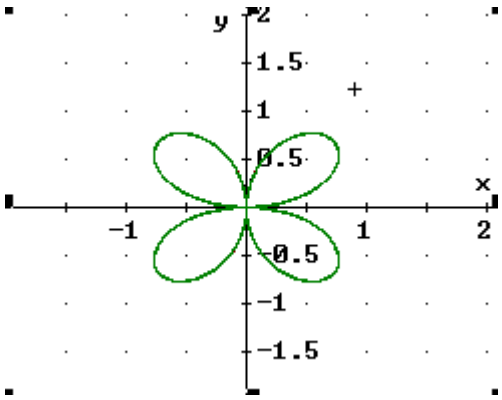
33-34 ROSE DI GRANDI Guido (1671 - 1742)

Le equazioni possono essere di due tipi:

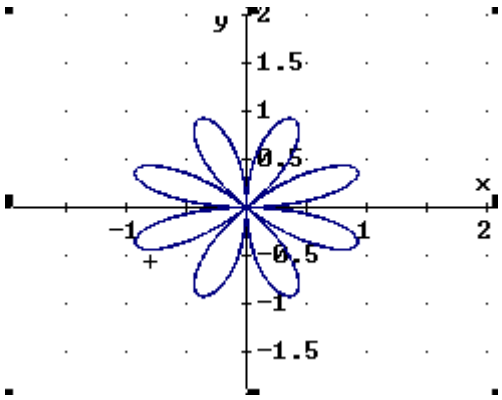
r = a SIN(nt)
oppure
r = a COS(nt)



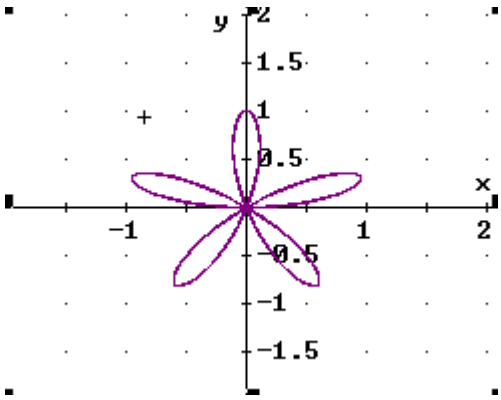
r = 1·SIN(3·t)



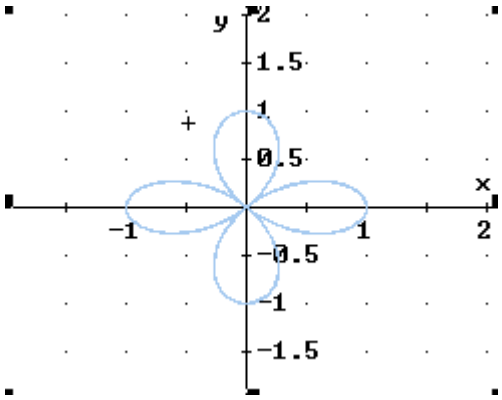
r = 1·SIN(2·t)



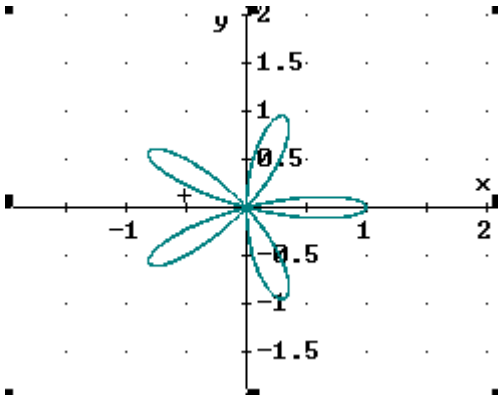
r = 1·SIN(4·t)



r = 1·SIN(5·t)



r = 1·COS(2·t)



r = 1·COS(5·t)

Si osserva che:
se **n è dispari** la rosa ha **n petali**
se **n è pari** la rosa ha **2n petali**.

mtb