

Etudes de courbes

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Courbes paramétrées

$$\begin{cases} x = \cos^3 t \\ y = \sin^3 t \end{cases} \quad (\text{astroïde}) \quad (1)$$

$$\begin{cases} x = t - \sin t \\ y = 1 - \cos t \end{cases} \quad (\text{cycloïde}) \quad (2)$$

$$\begin{cases} x = t - \tanh t \\ y = \frac{1}{\cosh t} \end{cases} \quad (\text{tractrice}) \quad (3)$$

$$\begin{cases} x = \ln \left| \tan \frac{t}{2} \right| + \cos t \\ y = \sin t \end{cases} \quad (\text{tractrice 2}) \quad (4)$$

$$\begin{cases} x = \frac{\sin t}{1 + \cos^2 t} \\ y = \frac{\sin t \cos t}{1 + \cos^2 t} \end{cases} \quad (\text{lemniscate de Bernoulli}) \quad (5)$$

$$\begin{cases} x = \frac{t}{1+t^4} \\ y = \frac{t^3}{1+t^4} \end{cases} \quad (\text{lemniscate de Bernoulli 2}) \quad (6)$$

$$\begin{cases} x = 2 \cos t + \cos 2t \\ y = 2 \sin t + \sin 2t \end{cases} \quad (\text{cardioïde}) \quad (7)$$

$$\begin{cases} x = 2 \cos t + \cos 2t \\ y = 2 \sin t - \sin 2t \end{cases} \quad (\text{deltoïde}) \quad (8)$$

$$\begin{cases} x = \sin 2t \\ y = \cos 2t \end{cases} \quad (\text{courbe de Lissajous}) \quad (9)$$

$$\begin{cases} x = \frac{t^3}{(t+1)^2(t-1)} \\ y = \frac{t^2}{t^2-1} \end{cases} \quad (10)$$

$$\begin{cases} x = (t+2) \exp\left(\frac{1}{t}\right) \\ y = (t-2) \exp\frac{1}{t} \end{cases} \quad (11)$$

$$\begin{cases} x = (t-1) \ln |t| \\ y = (t+1) \ln |t| \end{cases} \quad (12)$$

$$\begin{cases} x = \frac{2t}{1+t^2} \\ y = \frac{t+2}{1-t^2} \end{cases} \quad (13)$$

$$\begin{cases} x = \frac{t}{t^2-1} \\ y = \frac{t+2}{(t-1)^2} \end{cases} \quad (14)$$

$$\begin{cases} x = \frac{t^3}{t^2-9} \\ y = \frac{t(t-2)}{t-3} \end{cases} \quad (15)$$

$$\begin{cases} x = \frac{t^3}{1+3t} \\ y = \frac{3t^2}{1+3t} \end{cases} \quad (16)$$

$$\begin{cases} x = t^2 + t^3 \\ y = t^2 + t^3 - 2t^4 - 2t^5 \end{cases} \quad (17)$$

$$\begin{cases} x = \sin 4t \\ y = \cos 3t \end{cases} \quad (18)$$

$$\begin{cases} x = \cos t \\ y = \frac{\sin^2 t}{2+\sin t} \end{cases} \quad (19)$$

$$\begin{cases} x = \cos^3 t + \sin t \\ y = \sin^3 t + \cos t \end{cases} \quad (20)$$

$$\begin{cases} x = 3 \cos t - 2 \sin^3 t \\ y = \cos 4t \end{cases} \quad (21)$$

$$\begin{cases} x = \frac{t^2+1}{t^3-1} \\ y = \frac{2t}{t^3-1} \end{cases} \quad (22)$$

$$\begin{cases} x = \frac{t-\sin t}{t^2} \\ y = \frac{1-\cos t}{t^2} \end{cases} \quad (23)$$

Courbes définies par une équation polaire

$$\rho = \frac{1}{\sin(\theta - \frac{\pi}{3})} \quad (24)$$

$$\rho = \frac{5}{4 \cos \theta + 3 \sin \theta} \quad (25)$$

$$\rho = \sin(\theta - \frac{\pi}{6}) \quad (26)$$

$$\rho = 2 \cos \theta - 3 \sin \theta \quad (27)$$

$$\rho = 1 + \cos \theta \quad (\text{cardioïde}) \quad (28)$$

$$\rho = \cos 2\theta \quad (29)$$

$$\rho = \cos 2\theta + \cos^2 \theta \quad (30)$$

$$\rho = \frac{\sin \theta \cos \theta}{\sin \theta - \cos \theta} \quad (31)$$

$$\rho = \cos 3\theta - 2 \quad (32)$$

$$\rho = \frac{1}{\cos \theta} + \cos^2 \theta \quad (33)$$

$$\rho = \cos^2 \theta \quad (34)$$

$$\rho = \tan \theta \quad (35)$$

$$\rho = 1 + \cos^2 \theta \quad (36)$$

$$\rho = \sqrt{\cos 2\theta} \quad (\text{lemniscate de Bernoulli}) \quad (37)$$

$$\rho = \pm \frac{1}{\sqrt{\sin 2\theta}} \quad (38)$$

$$\rho = \frac{1}{\cos \theta} + \frac{1}{\sin \theta} \quad (39)$$

$$\rho = \frac{3}{1 + 2(\cos \theta + \sin \theta)} \quad (\text{conique}) \quad (40)$$

$$\rho = \frac{2}{4 + \sqrt{3} \sin \theta + \cos \theta} \quad (41)$$

$$\rho = \frac{\cos 2\theta}{\cos \theta} \quad (42)$$

$$\rho = \frac{\sin \theta}{\sin \theta - \cos \theta} \quad (43)$$

$$\rho = \exp(\theta) \quad (44)$$

$$\rho = \frac{2 \cos \theta + 1}{2 \sin \theta + 1} \quad (45)$$

$$\rho = \frac{1}{\theta} \quad (46)$$

$$\rho = \frac{1}{1 + \exp(-\theta)} \quad (47)$$

$$\rho = \frac{1}{\cos 2\theta - \cos \theta} \quad (48)$$

$$\rho = \frac{\sin \theta}{\theta} \quad (49)$$

$$\rho = \frac{1}{\cos^3 \frac{\theta}{3}} \quad (50)$$

$$\rho = \frac{1}{1 + \tan \frac{\theta}{4}} \quad (51)$$

$$\rho = \tanh \frac{\theta}{2} \quad (52)$$