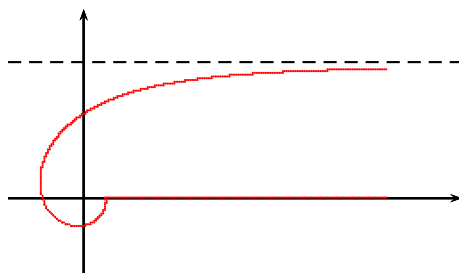
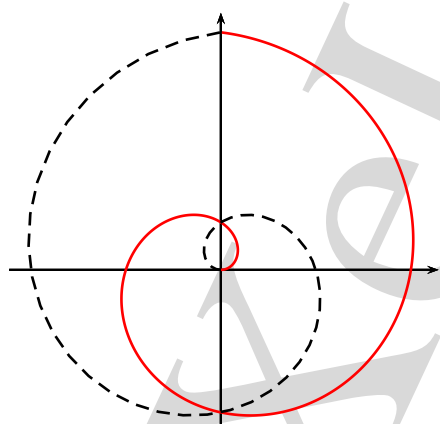
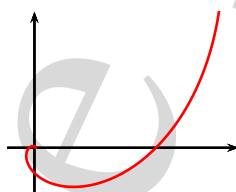
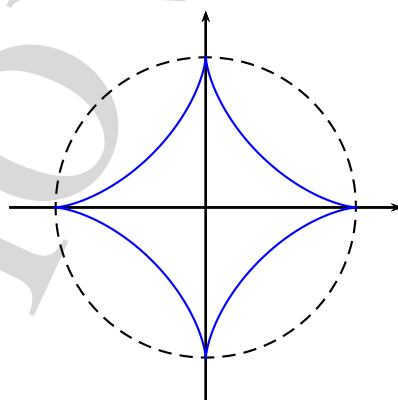


常用函数曲线图形

Figure 1: 双曲螺线 $r\theta = a$ Figure 2: 阿基米德螺线 $r = a\theta$ (又称等速螺线)Figure 3: 对数螺线 $r = ae^\theta$ (又称等角螺线)Figure 4: 星形线 $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$

$$\text{或} \begin{cases} x = a \cos^3 t \\ y = a \sin^3 t \end{cases}$$

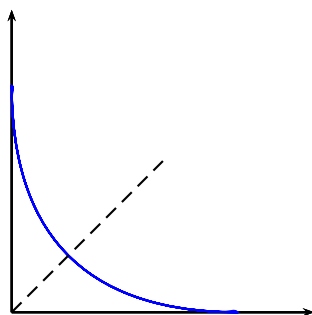


Figure 5: 斜抛物线 $\sqrt{x} + \sqrt{y} = \sqrt{a}$

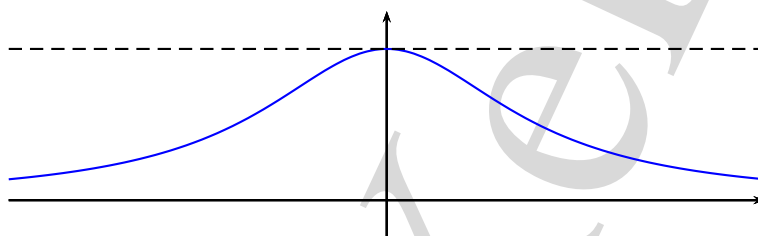


Figure 6: 箕舌线 $y = \frac{8a^3}{x^2 + 4a^2}$

$$\text{或} \begin{cases} x = 2a \tan \theta \\ y = 2a \cos^2 \theta \end{cases}$$

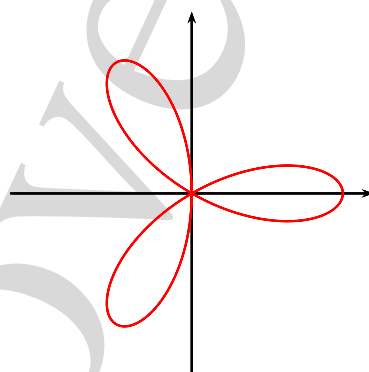
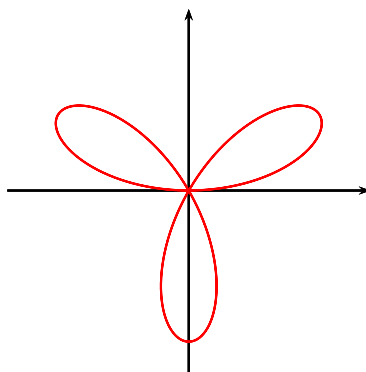
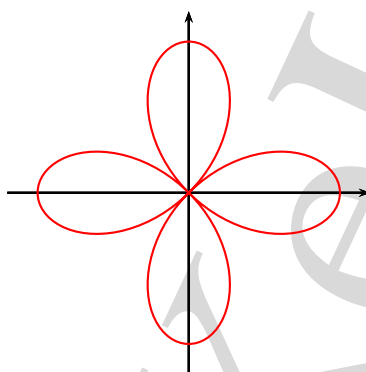
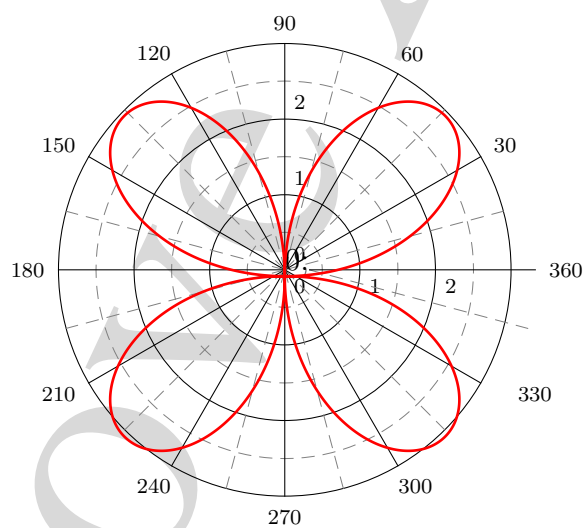


Figure 7: 三叶玫瑰 $r = a \cos 3\theta$

Figure 8: 三叶玫瑰 $r = a \sin 3\theta$ Figure 9: 四叶玫瑰 $r = a \cos 2\theta$ Figure 10: 四叶玫瑰 $r = a \sin 2\theta$

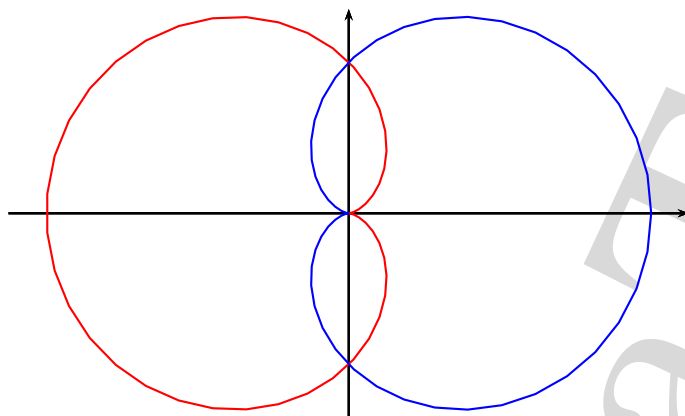


Figure 11: 心脏线 $r = a(1 - \cos \theta)$ 或 $x^2 + y^2 + ax = a\sqrt{x^2 + y^2}$ 心脏线 $r = a(1 + \cos \theta)$

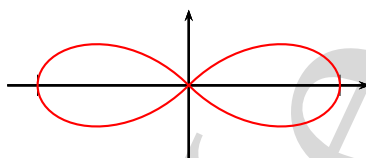


Figure 12: 双扭线 $r^2 = a^2 \cos 2\theta$ 或 $(x^2 + y^2)^2 = a^2(x^2 - y^2)$

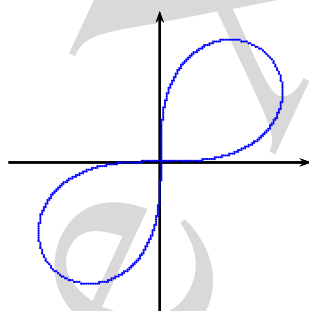


Figure 13: 双扭线 $r^2 = a^2 \sin 2\theta$ 或 $(x^2 + y^2)^2 = 2a^2xy$

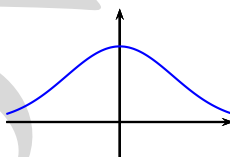
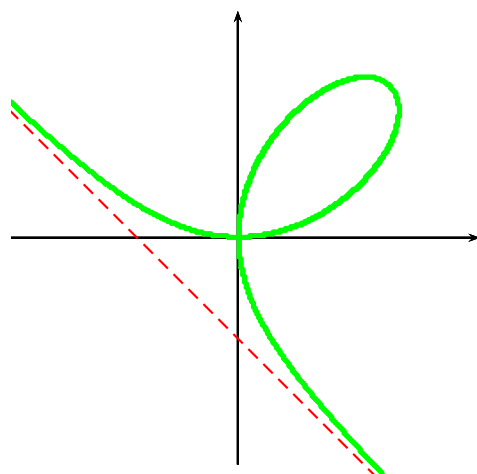
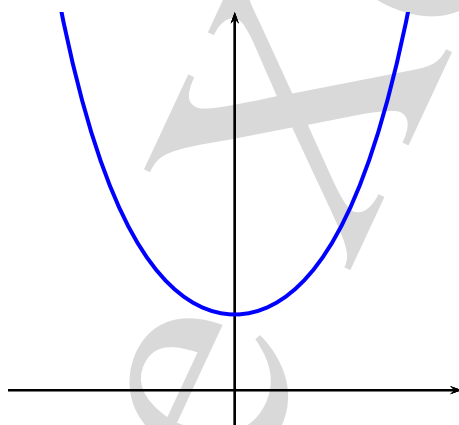


Figure 14: 概率曲线 $y = e^{-x^2}$

Figure 15: 笛卡尔叶形线 $(x^3 + y^3) = 3axy$

或 $\begin{cases} x = \frac{3at}{1+t^3} \\ y = \frac{3at^2}{1+t^3} = tx \end{cases}$ 渐近线为 $x + y + a = 0$, 这里取 $a=4/3$

Figure 16: 悬链线 $y = a \cosh \frac{x}{a}$ 或 $y = \frac{a}{2}(e^{\frac{x}{a}} + e^{-\frac{x}{a}})$

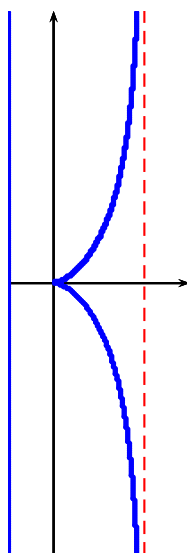


Figure 17: 蔓叶线 $y^2(2a - x) = x^3$, (渐近线 $x = 2a$)

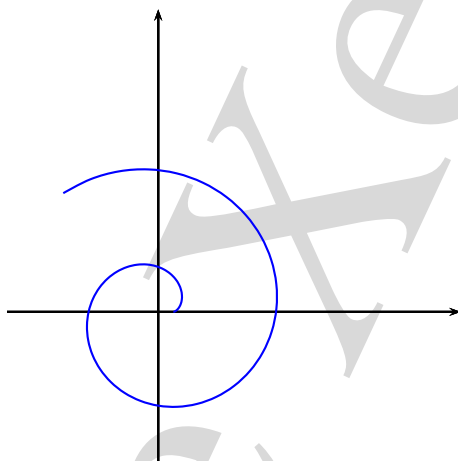


Figure 18: 圆的渐开线

$$\begin{cases} x = a(\cos t + t \sin t) \\ y = a(\sin t - t \cos t) \end{cases}$$

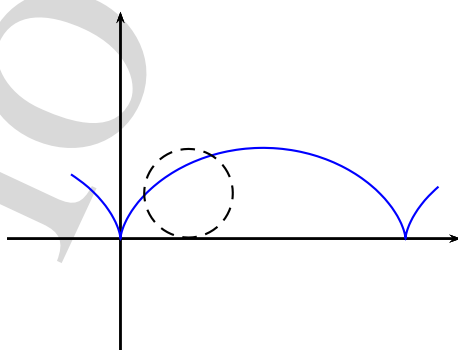


Figure 19: 摆线(又称旋轮线)

$$\begin{cases} x = a(t - \sin t) \\ y = a(1 - \cos t) \end{cases}$$

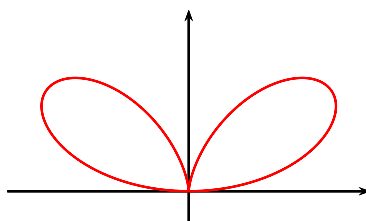


Figure 20: 双叶线 $r = a \sin \theta \cos^2 \theta$ 或 $(x^2 + y^2)^2 = ax^2y$

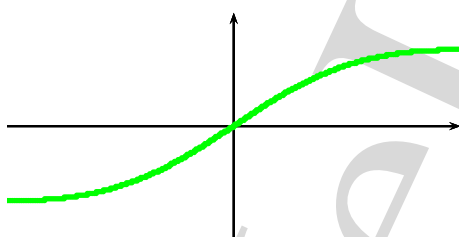


Figure 21: 蛇形线 $(a^2 + x^2)y = abx$

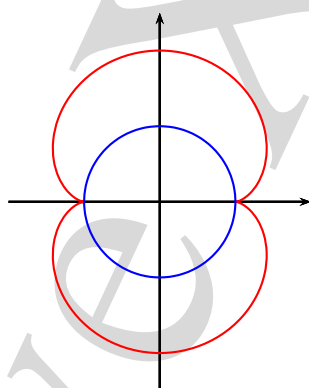


Figure 22: 肾脏线

$$\begin{cases} x = \frac{1}{2}a(3 \cos \phi - \cos 3\phi) \\ y = \frac{1}{2}a(3 \sin \phi - \sin 3\phi) \end{cases}$$

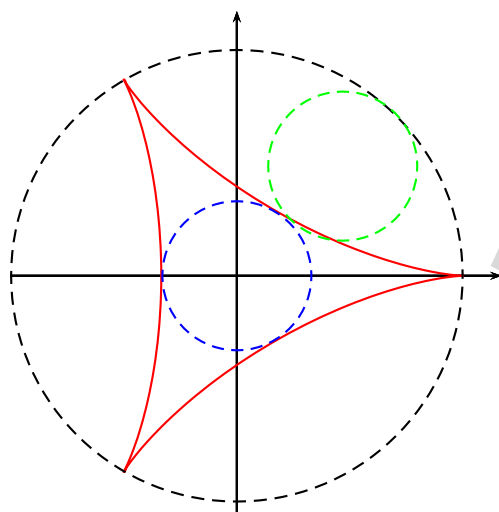
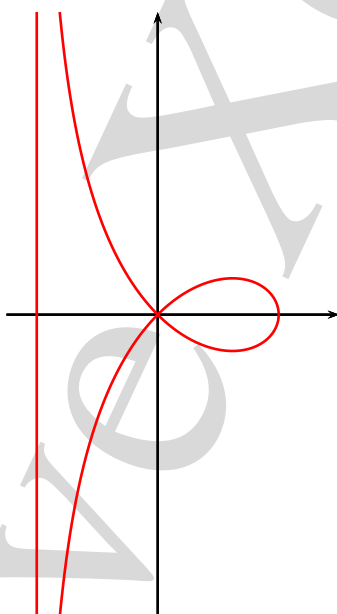


Figure 23: 三尖圆内旋轮线

$$\begin{cases} x = 2a \cos \varphi + a \cos 2\varphi \\ y = 2a \sin \varphi - a \sin 2\varphi \end{cases}$$

Figure 24: 环索线 $r = a \cos 2\theta \sec \theta$ 或 $y^2 = x^2 \frac{a-x}{a+x}$