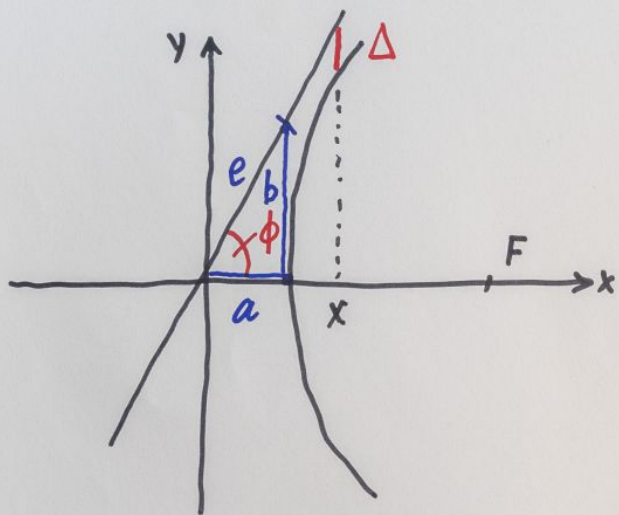


Kegelschnitte

Hyperbel - Teil 3

Asymptoten der Hyperbel



$$\begin{aligned}\Delta &= \frac{b}{a}x - \frac{b}{a}\sqrt{x^2 - a^2} \\ &= \frac{b}{a} \frac{(x - \sqrt{x^2 - a^2})(x + \sqrt{x^2 - a^2})}{x + \sqrt{x^2 - a^2}} \\ &= \frac{b}{a} \cdot \frac{a^2}{x + \sqrt{x^2 - a^2}} \xrightarrow{x \rightarrow \infty} 0\end{aligned}$$

Hyperbel $y = \pm \frac{b}{a} \sqrt{x^2 - a^2}$

Gerade $y = \pm \frac{b}{a} x$, Asymptoten der Hyperbel

Anstieg: $\tan \phi = \frac{b}{a}$

$$\cos \phi = \frac{1}{\sqrt{1 + \tan^2 \phi}} = \frac{1}{\sqrt{1 + \frac{b^2}{a^2}}} = \frac{a}{e} = \frac{1}{\varepsilon}$$

$$\rightarrow \phi = \varphi_{\varepsilon}$$