asymptote*

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If a plane curve γ has a branch continuing infinitely far from the origin O, then γ may have an *asymptote*: The direct line l is an asymptote of γ, if

$$\lim_{d(P,\,O)\to\infty} d(P,\,l) = 0,$$

where $d(P,\,O)$ means the distance of the point P of the branch from the origin and $d(P,\,l)$ the distance of P from the line l.

Examples: The hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ has the asymptotes $y = \pm\frac{b}{a}x$; the curve $y = \frac{\sin x}{x}$ the asymptote $y = 0$.

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