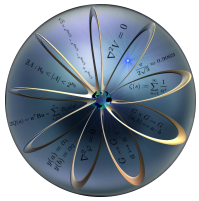

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classical differential geometry

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Related topic	DifferentialGeometry

Curves in $\mathbb{R}^2$

- inflexion point
- singular points of plane curve
- isocline
- curvature (plane curve)
- circle of curvature
- curvature determines the curve
- curvature of Nielsen's spiral
- osculating curve
- orthogonal curves
- isogonal trajectory
- parallel curves
- properties of parallel curves
- evolute
- evolute of cycloid
- `http://planetmath.org/SerretFrenetEquationsInMathbbR2`Serret-Frenet equations in $\mathbb{R}^2$
- famous curves in the plane
- arc-parametrizations
- envelope
- determining envelope
- catacaustic

Curves in $\mathbb{R}^3$

- http://planetmath.org/SerretFrenetFormulasSerret-Frenet equations in $\mathbb{R}^3$
- space curve
- level curve
- http://planetmath.org/CurvatureOfACurvecurvature and http://planetmath.org/Tors of a space curve
- moving trihedron

Surfaces in $\mathbb{R}^3$

- level curve, level surface
- surface of revolution
- surface normal
- normal section
- normal curvatures
- Meusnier's theorem
- mean curvature at surface point
- http://planetmath.org/FirstFundamentalFormfirst fundamental form
- second fundamental form
- sphere map and shape operator
- Gaussian curvature and mean curvature
- geodesic
- Gauss-Bonnet theorem
- standard connection in $\mathbb{R}^3$
- Gauss equation

The space $\mathbb{R}^3$

- ortho-normal frame fields in $\mathbb{R}^3$ (or non constant ortho-normal triples of vector fields)
- rate of rotation of an o.f.f.
- euclidean spin connection
- **$\mathbb{R}^3$ Cartan structural equations I, II**

Variational calculus

- calculus of variations
- classical isoperimetric problem
- least surface of revolution
- brachistochrone curve
- equation of catenary via calculus of variations