Evolute and Involute, version 1.0, 2018-02-15

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Given a plane curve its evolute is defined as   
  
where ρ(t) is the signed radius of curvature and n the unit normal vector to c. The evolute of a curve can also be described as the locus of its centers of curvature or as the envelope of its normals. For example, the evolute of an ellipse is an asteroid (see p.1.3).

The involute of a plane curve c is defined as

Here, ‘ symbolizes the derivative with respect to t and | | the Euclidean norm.

The involute can be visualized by winding a taut string onto the given curve and tracing the endpoint of that string or by unwinding the string. For example, the involute of the unit circle c(t)=(cos(t),sin(t)) is given as   
inv(t)= (cos(t)+t\*sin(t), sin(t)-t\*cos(t)), (see p.1.4)  
The parameter a, the lower bound in the integral, can be seen as the starting point of the winding or unwinding process.

This file contains two basic functions, evolute(x(t),y(t)) and involute(x(t),y(t),a).  
They both return a two-dimensional list with the expressions for the x- and y-coordinate for the evolute or involute of the input curve. See the examples on page 1.2.

Attention: These functions work only on CAS calculators or computer software.