

Interactive Web Pages

1 Plots with a Parameter

- drawing tangent lines to a curve
- elements of interacts

2 An Application

- a four bar mechanism
- solving a system of polynomial equations

MCS 320 Lecture 33
Introduction to Symbolic Computation
Jan Verschelde, 19 July 2024

Interactive Web Pages

1 Plots with a Parameter

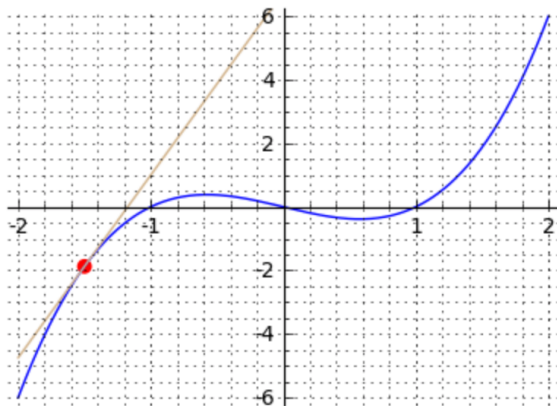
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Tangent Lines to a Curve

x-coordinate



The x -coordinate of the point at the curve is the parameter we move.

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Elements of Interacts

Three stages in building an interactive web page.

- 1 Define the moving parameter in the plot.
- 2 Similar to a Graphical User Interface, we have sliders, selectors, drop down menus.
- 3 Deploy the interact on an HTML page.

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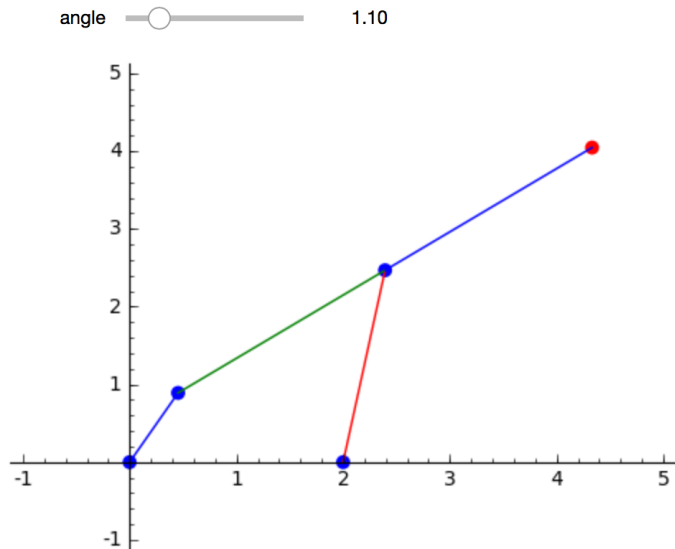
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A Four Bar Mechanism



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The Connector Point

The coordinates (x, y) of the connector point are at the intersection of two circles.

- ① The point (x, y) is at distance $5/2$ from the point $(2, 0)$:

$$(x - 2)^2 + y^2 - \left(\frac{5}{2}\right)^2 = 0.$$

- ② The point (x, y) is at distance $5/2$ from the point (c, s) :

$$(x - c)^2 + (y - s)^2 - \left(\frac{5}{2}\right)^2 = 0,$$

where $c = \cos(\theta)$ and $s = \sin(\theta)$.

With resultants we compute expressions for (x, y) in function of the parameters c and s .