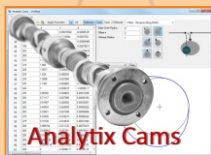


Mathematical Technology



Mechanical Expressions

Graduate - Post Graduate - Research Scholar

Syllabus - Projects - Research Application

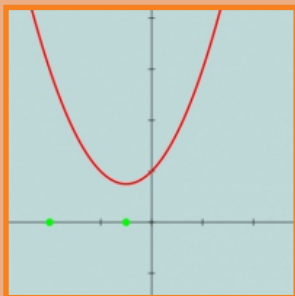
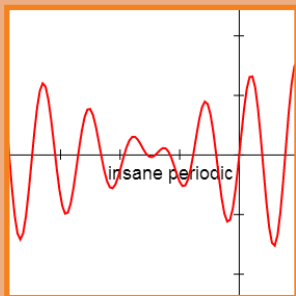
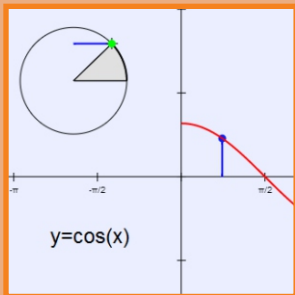
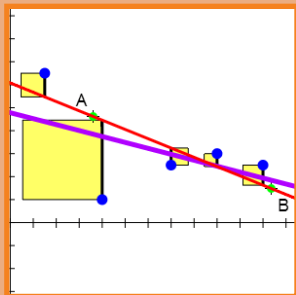
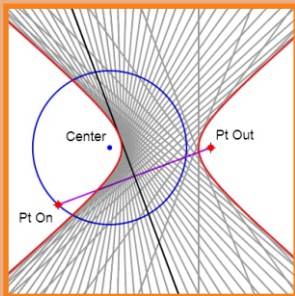


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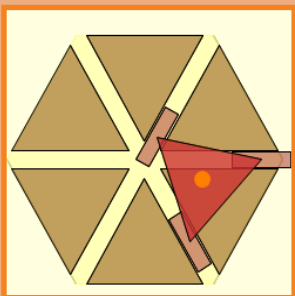
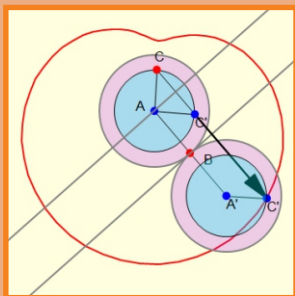
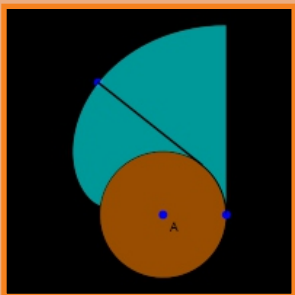
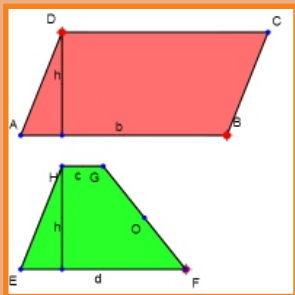
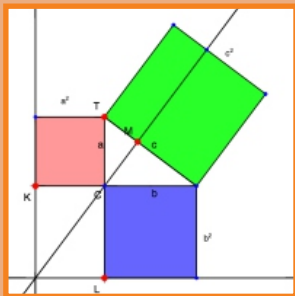


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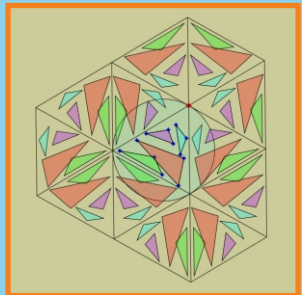
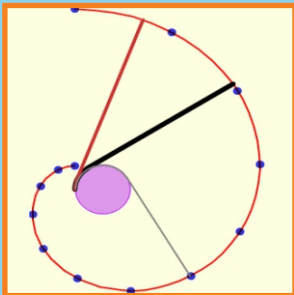
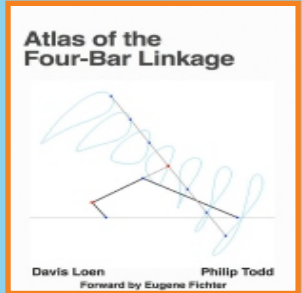
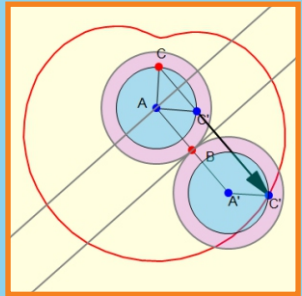
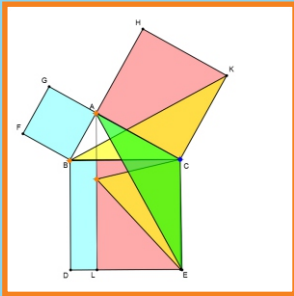
Saltire Knowledge Base



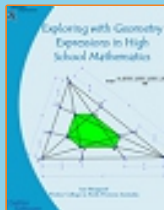
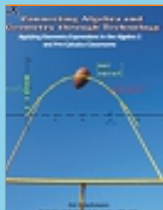
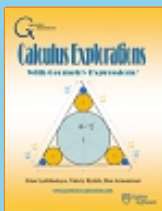
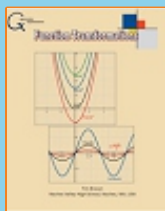
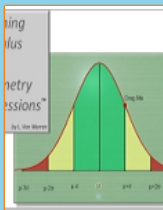
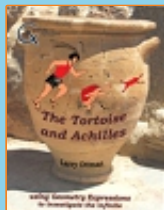
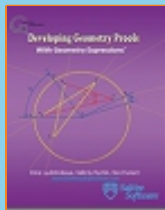
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Apps & E - Book



GE Books



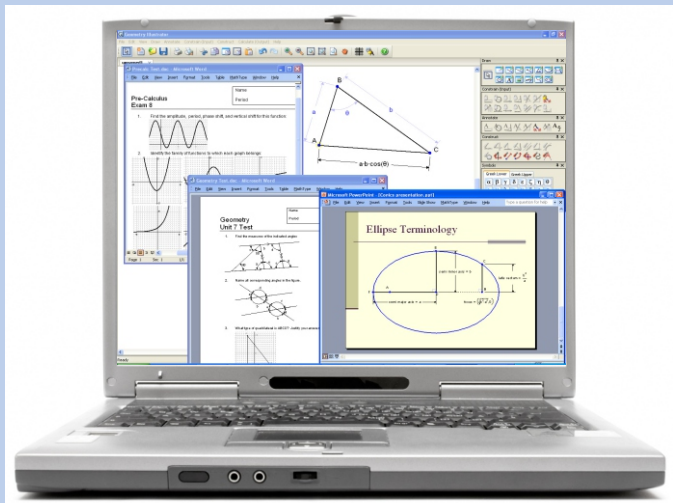
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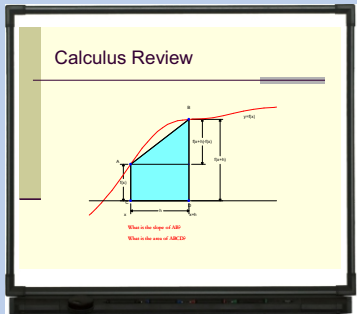
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System Requirements

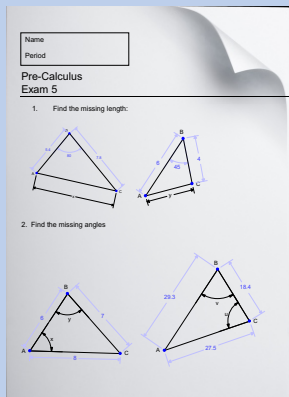
PC running Windows XP, Vista, or Windows 7
Intel Based Macintosh

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$$\begin{aligned} X &= \frac{a \cdot r \left[r + 3 \cdot a \cdot \cos(t) - 2 \cdot a \cdot \cos(t)^3 \right]}{2 \cdot a^2 + r^2 + 3 \cdot a \cdot r \cdot \cos(t)} \\ \Rightarrow Y &= \frac{a^2 \cdot r \cdot (3 \cdot \sin(t) - \sin(3 \cdot t))}{2 \cdot [2 \cdot a^2 + r^2 + 3 \cdot a \cdot r \cdot \cos(t)]} \end{aligned}$$

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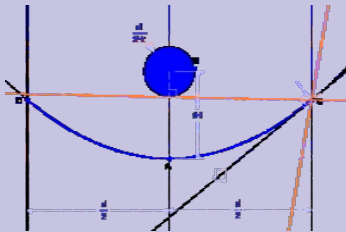
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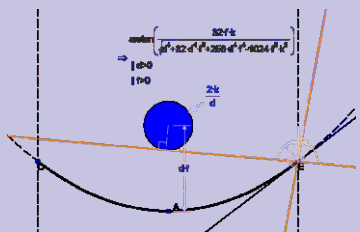
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Mathematical Modeling in 4 steps

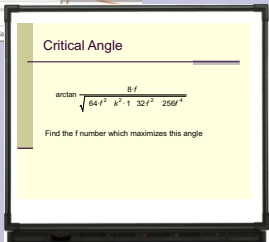
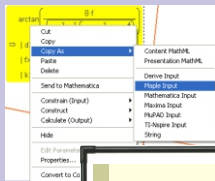
1. Create a model



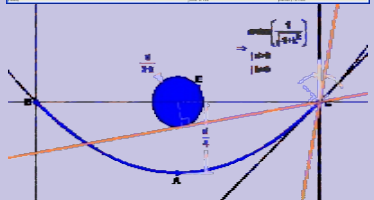
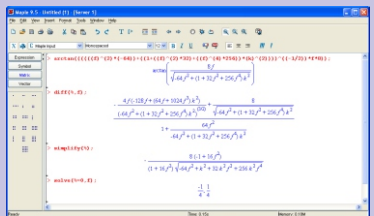
2. Make a measurement



3. Copy into MathType or CAS



4. Solve by hand, or by CAS



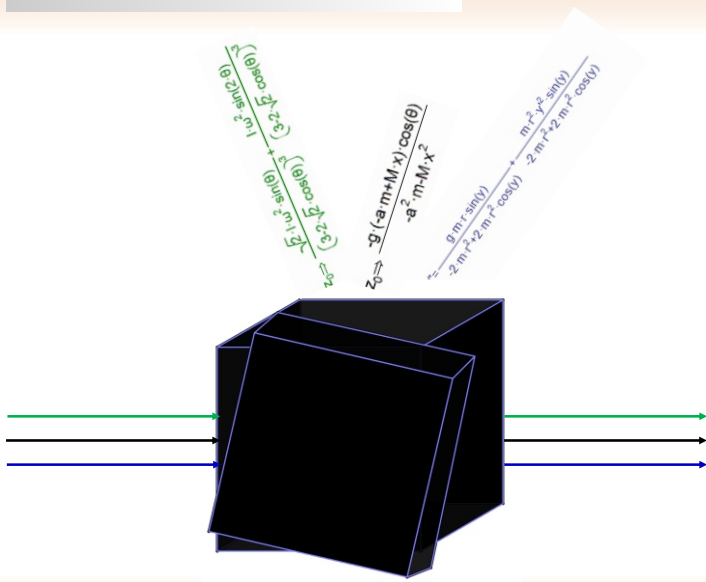
System Requirements

PC running Windows XP, Vista, or Windows 7
Intel Based Macintosh



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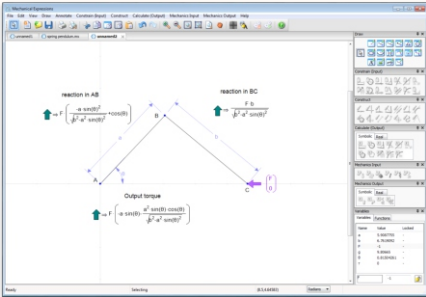


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Break Open the Black Box



Explore Models

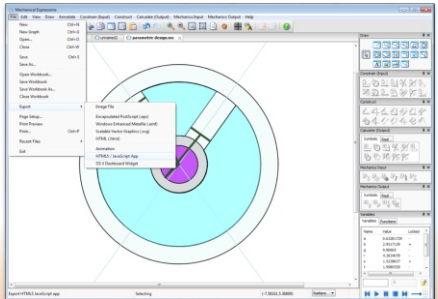
- Statics
- Dynamics
- Inverse Dynamics
- Kinematics
- Geometric Modeling

Create Models

- Make a sketch
- Add Constraints
- Apply velocities, masses and force elements
- Extract output expressions for velocities, acceleration and forces

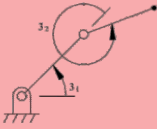
Share Models

- Copy expressions to and from CAS systems like *Mathematica* or *Maple*
- Send output as Tex, MathML
- Or as computer source code in:
 - C
 - C++
 - C#
 - VB
 - VBA
 - Java
 - JavaScript
 - ActionScript
 - Lua
- Display an interactive Dynamic Simulation as a browser app or dashboard Widget



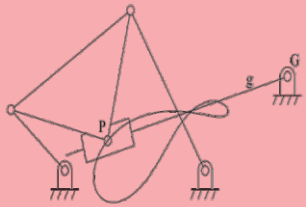
MechanicalExpressions.com



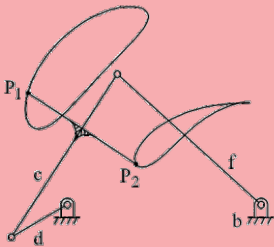


A nalytix 21

design the future



Analytix 21 is a sophisticated mechanism design - and -analysis software package for the PC that puts you, the engineer, back in control of the creative process.



analytix 21 design the future

Analytix and Dynamix have been combined to form Analytix 21!

Analytix 21: A truly interactive and flexible engineering toolset that incorporates both mathematical and geometrical input and output with powerful modeling capability.

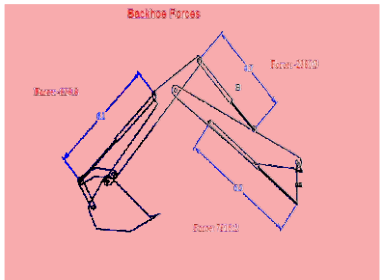
Utilize the power of sketching — The power of Analytix 21 is the system's ability to construct geometry from dimensional information. Geometry is sketched on the screen just as if it were a piece of paper. Dimensions are then added to the sketch.

Utilize the power of dimensions — Dimensions serve as constraints and define the exact geometry of the sketch. Fine tuning the model is simply a matter of changing the value of a dimension. The geometry is updated and a new scaled drawing is displayed in an instant.

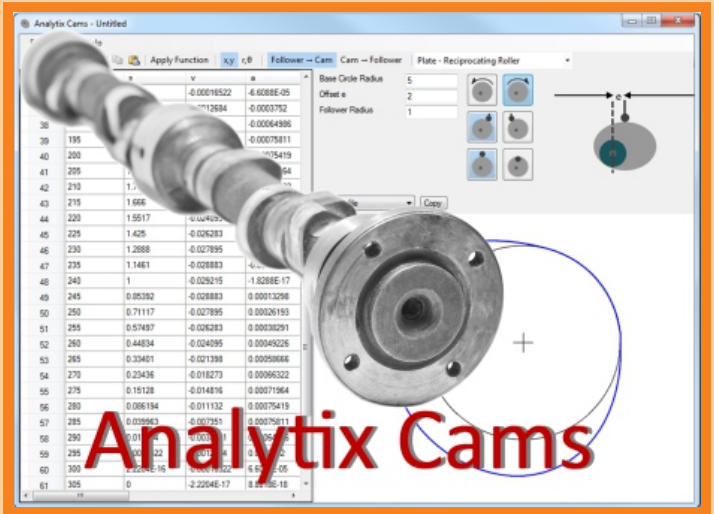
Utilize the power of analysis — Analytix 21 analyzes the design's static, kinematic, dynamic and tolerance characteristics for the dimensioned geometry. Output resultant force, torque, stress and deflection on trusses. Dimensions, velocities and accelerations can be displayed for every step of a Dynamic Simulation in tables and graphs.

Benefits You Can Expect from Analytix 21

- Faster Time-to-Market
- Lower Prototyping and Product Cost
- Reduced Liability/Warranty Risk
- More Competitive Product Performance
- Improved Engineering Productivity



Analytix Cams 21



Analytix Cams enables mechanical engineers to quickly synthesize a cam profile given their follower motion requirements. Or...from an existing cam profile, the follower's geometry and kinematics can be quickly designed, fine-tuned and analyzed. With Analytix simulation software, you can optimize the cam/follower interaction with your mechanical system. Then export DXF to CAD or coordinate data to NC/CAM software.

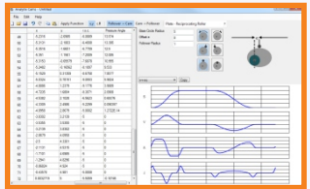
Analytix Cams 21



Here's how Analytix Cams is used to synthesize a cam profile. First, you choose the cam/follower type and such things as direction of rotation and follower offset. Then select a range of cam rotation, specify the starting and ending requirements for follower displacement, and the desired curve type (such as cycloidal, dwell, or constant acceleration).

Analytix/Cams then automatically synthesizes the precise points in between, taking into account all the geometry involved in that particular cam/follower configuration.

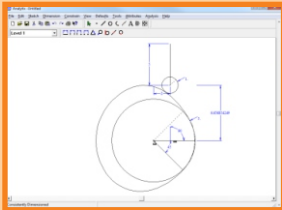
For example, you can specify that the follower angle should have a modified trapezoidal rise of 35 degrees between 0 and 90 degrees of cam rotation and so on. The advanced user always has the option of fine-tuning the data points manually (or inserting them from another source).



Kinematic and other data is automatically calculated and displayed in both tabular form and graphical form: displacement, velocity, acceleration, jerk, radius of curvature and pressure angle.

Any cam profile developed in Analytix Cams can also be used inside Analytix mechanical simulation software to analyze the cam motion in combination with actuators, linkages, or other parts of a larger mechanical system.

Cam design and mechanism analysis can be done quickly in an affordable, integrated solution, letting you work back from required end-effector motion to cam/follower design or vice versa.



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Mathematical Technology

Mechanical Engineering

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