ptc

ptc mathcad®

What's New

12.0.0.0

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Contents

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Application Enhancements

New 2D Plot Formatting Features

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Plots**.

Videos

Watch this video to learn more about the new 2D plot formatting features in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

PTC Mathcad Prime includes several native 2D plot types, and PTC Mathcad Prime 12.0.0.0 provides more formatting features to use with some of those plots. The new enhancements include:

- Plot titles can now be added as an integral part of XY and polar plots—Enabling the plot title adds a text region that can be positioned above or below the trace and can be used to title the plot using full text formatting options.
- Axis titles can now be added as an integral part of XY plots—Enabling individual axis titles adds text regions aligned with the relevant XY axes that can be used to title the axes using full text formatting options.
- A plot legend can now be added as an integral part of XY and polar plots—Enabling an editable, formattable legend that describes traces to various user-selected positions on the plot.
- Gridlines can now be turned on for XY and polar plots—Enabling gridlines displays both X and independent gridlines on the plot.

Improvements to the Worksheet Calculation Performance

PTC Mathcad Prime 12.0.0.0

User Interface Location: N/A.

Description

PTC Mathcad Prime 12.0.0.0 continues the enhancements started in PTC Mathcad Prime 11.0.0.0 to improve worksheet calculation performance for large, dense worksheets. Additional improvements will be added in PTC Mathcad Prime 13.0.0.0.
The new performance updates include:

- Improving the engine interaction using cache when opening a worksheet

- Addressing lagging updates of the region's UI after a calculation has completed
- Streamlining and optimizing calculation animation
- Optimizing the running of advanced control scripts during calculation events

Benefits

These performance improvements are more notable in large, dense worksheets. However, smaller worksheets will also benefit from them.

Hide Symbolic Keywords and Modifiers

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Math** ▸ **Operators and Symbols** ▸ **Symbolics**.

Videos

Watch this video to learn more about hiding symbolic keywords and modifiers in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

In PTC Mathcad Prime 12.0.0.0 you can now hide symbolic keywords and modifiers, such that when the math region that includes them is not active, they are not displayed. When the region is inactive, hiding symbolic keywords and modifiers collapses the space that they occupy, displaying the symbolic evaluation operator as its default size.

Header and Footer Updates

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Document** ▸ **Headers and Footers**.

Videos

Watch this video to learn more about header and footer updates in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

To enhance the documentation options for PTC Mathcad Prime 12.0.0.0 worksheets, two new header and footer formatting options have been added in this release:

- Set a different header and footer for the first page of a worksheet
- Start and end page numbering on a user selected page

These enhancements offer more flexibility in how one or more PTC Mathcad Prime worksheets can be used together. For example, using the ability to start and end page numbering on the page numbers of your choice enables you to correctly number the last and first pages of two different worksheets that you want to be presented together.

Microsoft .NET 8 Support

PTC Mathcad Prime 12.0.0.0

User Interface Location: N/A.

Description

PTC Mathcad Prime 12.0.0.0 is migrated to run on Microsoft .NET, enabling future releases to take advantage of the powerful new development tools provided by that platform.

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Engine Enhancements

Function Analysis Functions

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Functions** ▸ **Function Analysis** and **Functions** ▸ **Expression Type**.

Videos

Watch this video to learn more about the new function analysis functions in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

PTC Mathcad Prime 12.0.0.0 includes new function analysis functions that can be used to mathematically analyze other expressions. The following functions are included in PTC Mathcad Prime 12.0.0.0:

- **isContinuous()**
- **discontPoints()**
- **localExtrema()**
- **localMinima()**
- **localMaxima()**
- **globalExtrema()**
- **globalMinima()**
- **globalMaxima()**
- **hasVariables()**
- **getVariables()**

MultiStart for Solver Functions

PTC Mathcad Prime 12.0.0.0

User Interface Location: Solve function RMB menu.

Videos

Watch this video to learn more about the use of **MultiStart** for solver functions (**maximize**, **minimize**, **find**, **minerr**) in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

MultiStart is a solving option you can select for the solver functions **maximize**, **minimize**, **find**, and **minerr** in PTC Mathcad Prime 12.0.0.0. **MultiStart** makes the nonlinear solver attempt to find a global maximum or minimum within the feasible region, rather than a local one. This way, it can be used to increase the probability of finding a valid solution for your calculations.

Optimized or Non-Optimized for Solver Functions

PTC Mathcad Prime 12.0.0.0

User Interface Location: Solve function RMB menu.

Videos

Watch this video to learn more about the use of optimized or non-optimized for solver functions (**maximize** and **minimize**) in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

In PTC Mathcad Prime 12.0.0.0, you can now control how to handle **maximize** and **minimize** function evaluations, allowing you to choose between speed (optimized) and accuracy (non-optimized).

Manual Definition of First and Second Derivatives for Solver Functions

PTC Mathcad Prime 12.0.0.0

User Interface Location: N/A

Videos

Watch this video to learn more about the manual definition of first and second derivatives for solver functions (**maximize** and **minimize**) in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

When evaluating **maximize** or **minimize** functions, PTC Mathcad Prime internally calculates approximated versions of the first and second derivatives of the objective function. In PTC Mathcad Prime 12.0.0.0, you can alternatively

choose to define the first and second derivatives using a direct formula, which in some cases can lead to faster or more accurate solutions.

Improvement of Calculus Operators in Symbolics

PTC Mathcad Prime 12.0.0.0

User Interface Location: N/A.

Videos

Watch this video to learn more about improvement of calculus operators in symbolics in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

The following improvements to calculus operators with the symbolic engine are introduced in PTC Mathcad Prime 12.0.0.0:

- Additional integral cases are supported, such as integrals of high-degree trigonometric functions.
- Additional improvement of the limit operator, such as limit of **piecewise** functions.
- Additional improvement of the range-summation operator, such as summation over matrix indices.
- Further improvement of the indefinite integral operator, such as optimization of output which expressed in terms of *atan*.
- Definite integrals and range-summations of large expressions work faster and are more stable.

Support for King Rule for Definite Integrals

PTC Mathcad Prime 12.0.0.0

User Interface Location: N/A.

Videos

Watch this video to learn more about the support of the King Rule for definite integrals in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

The existing support for calculating definite integrals using symbolic computation has been expanded to support King Rule for definite integrals. This new capability enables solving additional types of definite integrals (previously not supported), which have the following form:

$$\int_a^b \frac{f(x)}{f(x)-f(a+b-x)}\,dx \rightarrow \frac{b-a}{2}$$

Improved Support for the clear Function

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Functions**.

Videos

Watch this video to learn more about the improved **clear** function support in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

In PTC Mathcad Prime 12.0.0.0 the **clear** function can now be used to reset system variables (*TOL*, *CTOL*, *ORIGIN*, *PRNPRECISION* and *PRNCOLWIDTH*) to their default values with numeric and symbolic engines.

Substitution of Integral Variables

PTC Mathcad Prime 12.0.0.0

User Interface Location: N/A.

Videos

Watch this video to learn more about substitution of integral variables in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

PTC Mathcad Prime 12.0.0.0 adds support for changing the integral variable in integrals using the keyword *substitute*, allowing you to perform the integration by substitution.

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Usability Enhancements

Hide Solve Block Labels

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Document** ▸ **Region Formatting** ▸ **Solve Block Labels**.

Videos

Watch this video to learn more about hiding solve block labels in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

In PTC Mathcad Prime 12.0.0.0 you can choose to hide the solve block guide labels **Guess Values**, **Constraints**, and **Solver**, so they are not displayed while the solve block is inactive. While solve blocks are active, the labels are always displayed.

Find and Replace Identifier with Subscript

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Find** and **Replace** fields in the status bar.

Videos

Watch this video to learn more about finding and replacing identifiers with subscript in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

The find and replace feature in PTC Mathcad Prime 12.0.0.0 is updated to include:

- The ability to find identifiers with subscripts
- The ability to replace the found identifiers with identifiers with subscript

You can add a subscript to an identifier in either the **Find** or **Replace** fields using the subscript keyboard shortcut or the **Text Formatting** tab. You can then find and replace using those identifiers with subscripts.

Support for Larger Page Sizes

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Document** ▸ **Page** ▸ **Page Size**.

Videos

Watch this video to learn more about support for larger page sizes in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

PTC Mathcad Prime 12.0.0.0 includes the ability to select larger worksheet page sizes: A2 and A1. These page sizes provide more space for content in **Page View**. The **Page View** of the worksheet is the content that is printed. Larger page sizes give you a bigger printable canvas for extensive PTC Mathcad Prime worksheets.

Worksheet Background Options

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Document** ▸ **Page** ▸ **Background**.

Videos

Watch this video to learn more about new worksheet background options in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

PTC Mathcad Prime 12.0.0.0 adds the ability to change the worksheet background in the following ways:

- From the default paper color to white, to better match the common paper color.
- From the default paper color to grey for those users who need a different contrast between the content and background.

Improvement of the Embedded OLE Object Display

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Input/Output** ▸ **Objects**.

Description

The display of embedded OLE objects has been improved in PTC Mathcad Prime 12.0.0.0 to support the clarity of image when resizing the OLE object or zooming in or out of the PTC Mathcad Prime worksheet.

Refresh Buttons for Include Regions

PTC Mathcad Prime 12.0.0.0

User Interface Location: **Input/Output ▸ Include Worksheet**.

Videos

Watch this video to learn more about include region refresh buttons in PTC Mathcad Prime 12.0.0.0:

See the video on the Learning Connector.

Description

In PTC Mathcad Prime 12.0.0.0 every include region provides a refresh button that can be used to retrieve the latest data from the included worksheet.