PTC university

Mathcad Prime 2.0

Curriculum Guide

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Live Classroom Curriculum Guide

- Mathcad Prime 2.0 Essentials

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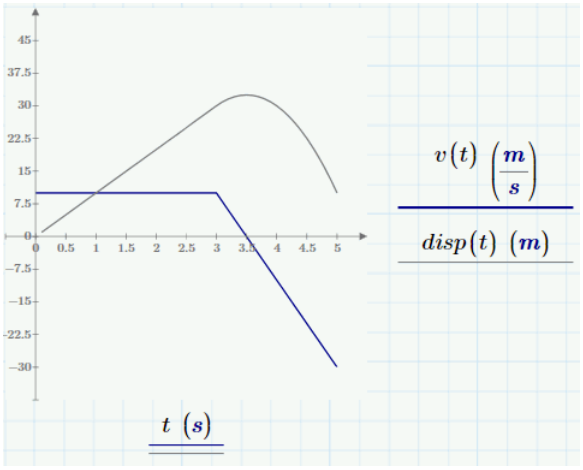
Mathcad Prime 2.0 Essentials

Overview

Course Code	TRN-3431-T
Course Length	2 Days

In this course, you will learn the basics Mathcad Prime. You will learn about Mathcad Prime's extensive functionality such as opening and working with Mathcad files, navigating workspaces, defining variables and expressions, and solving equations. Further, you will learn how to plot graphs, solving for roots and manipulating data. At the end of each module, you will find a set of review questions to reinforce critical topics from that module. Your instructor will discuss these with the class. At the end of the course, you will find a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.



Course Objectives

- Open and save Mathcad files.
- Navigate the Mathcad workspace.
- Identify and format math and text regions.
- Develop and edit math expressions.
- Define, evaluate, and use variables.
- Assign an expression retroactively.
- Define and evaluate user-defined and built-in functions.
- Define, evaluate, and use range variables.
- Use units in calculations.
- Plot 2-D and 3-D graphs.
- Solve for the roots of a function with a single independent variable.
- Symbolically solve equations.
- Numerically solve a system of linear and nonlinear equations.
- Solve unconstrained and constrained optimization problems.
- Solve ordinary differential equations.
- Create a program within the Mathcad worksheet using Mathcad's programming features.
- Import and export data.
- Smooth, interpolate, and regress data.

$$v(t) := 10 \cdot \frac{m}{s} + \left(-20 \cdot \frac{m}{s^2}\right) \cdot (t - 3 \cdot s) \cdot (t > 3 \cdot s)$$

Prerequisites

- N/A

Audience

- This class is intended for the novice or intermediate user of Mathcad.

Agenda

Day 1

Module	1	Getting Started
Module	2	Documenting and Formatting
Module	3	Entering and Editing Math
Module	4	Variables
Module	5	Functions
Module	6	Range Variables
Module	7	Controlling Calculations
Module	8	Vectors and Matrices
Module	9	Units
Module	10	2-D Plotting
Module	11	Project – Day 1
Module	12	3-D Plotting

Day 2

Module	13	Boolean Conditions
Module	14	Symbolics
Module	15	Solving
Module	16	Optimization
Module	17	Differential Equations
Module	18	Programming
Module	19	Data Exchange
Module	20	Data Analysis
Module	21	Project – Day 2

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Web Based Curriculum Guide

- Mathcad Prime 2.0 - Application Orientation
- Mathcad Prime 2.0 - Working With Units
- Mathcad Prime 2.0 - Plotting
- Mathcad Prime 2.0 - Symbolics and Solving
- Mathcad Prime 2.0 - Programming Mathematical Expressions
- Mathcad Prime 2.0 - Data Exchange and Analysis
- Design of Experiments Using Mathcad Prime 2.0
- Mathcad Prime 2.0 Integration with Creo Parametric

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Mathcad Prime 2.0 - Application Orientation

Overview

Course Code	WBT-3431-A
Course Length	4 Hours

$a = b = 2 \cdot \sqrt{10}$ $\theta = 30 \cdot deg = 0.524 \cdot rad$

In this course, you will learn the essentials of Mathcad Prime and understand how it reinforces Mathcad Prime's extensive functionality using clear, straightforward instruction and examples. This course will familiarize the user with many of Mathcad Prime's critical features to ensure immediate application of the product.

At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. At the end of the course, you will complete a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.

Course Objectives

- Open and save Mathcad files
- Navigate the Mathcad workspace
- Identify and format math and text regions
- Develop and edit math expressions
- Define, evaluate, and use variables
- Assign an expression retroactively
- Define and evaluate user-defined and built-in functions
- Define, evaluate, and use range variables
- Define and use vectors and matrices

$$CP := \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

Prerequisites

- None

Audience

- This class is intended for the novice or intermediate user of Mathcad.

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Mathcad Prime 2.0 - Working With Units

Overview

Course Code	WBT-3431-B
Course Length	2 Hours

$mass := 40 \cdot kg$

In this course, you will learn the essentials of working with units using Mathcad Prime. You will understand how it reinforces Mathcad Prime's units functionality using clear, straightforward instruction and examples.

At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. At the end of the course, you will complete a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.

Course Objectives

- Use units in calculations

$10\ °F - 10\ \Delta°F = 0\ °F$

Prerequisites

- WBT–3431–A Mathcad Prime 2.0 – Application Orientation

Audience

- This class is intended for the novice or intermediate user of Mathcad.

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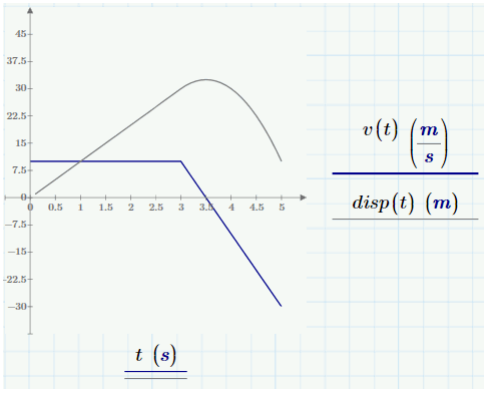
Mathcad Prime 2.0 - Plotting

Overview

Course Code	WBT-3431-C
Course Length	2 Hours

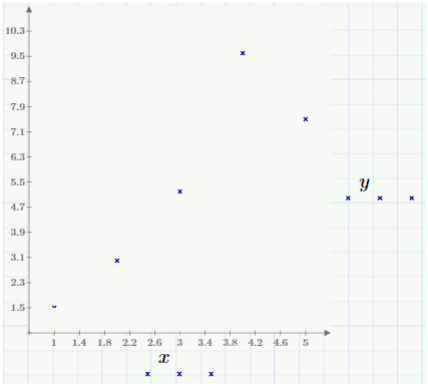
In this course, you will learn the essentials of 2D and 3D Plotting using Mathcad Prime. You will understand how it reinforces Mathcad Prime's plotting functionality using clear, straightforward instruction and examples.

At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. At the end of the course, you will complete a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.



Course Objectives

- Plot 2-D and 3-D graphs
- Format 2–D and 3-D graphs



Prerequisites

- WBT-3431_A Mathcad Prime 2.0 – Application Orientation

Audience

- This class is intended for the novice or intermediate user of Mathcad.

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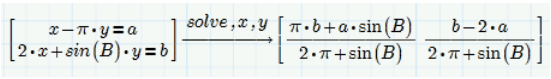
Mathcad Prime 2.0 - Symbolics and Solving

Overview

Course Code	WBT-3431-D
Course Length	2 Hours

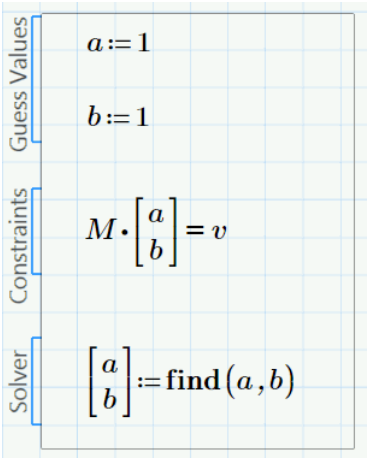


In this course, you will be introduced to the essentials of symbolics and solving equations using Mathcad Prime. You will understand how it reinforces Mathcad Prime's symbolics and solving functionality using clear, straightforward instruction and examples.

At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. At the end of the course, you will complete a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.

Course Objectives

- Solve for the roots of a function with a single independent variable
- Numerically and symbolically solve a system of linear and nonlinear equations
- Solve unconstrained and constrained optimization problems
- Solve ordinary differential equations



Prerequisites

- WBT–3431–A Mathcad Prime 2.0 – Application Orientation

Audience

- This class is intended for the novice or intermediate user of Mathcad.

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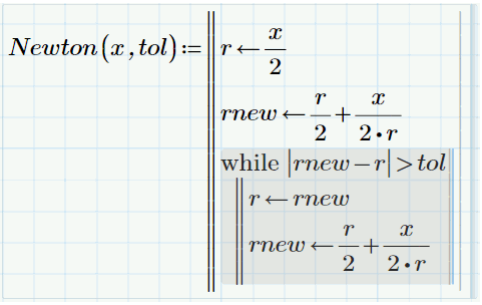
Mathcad Prime 2.0 - Programming Mathematical Expressions

Overview

Course Code	WBT-3431-E
Course Length	3 Hours

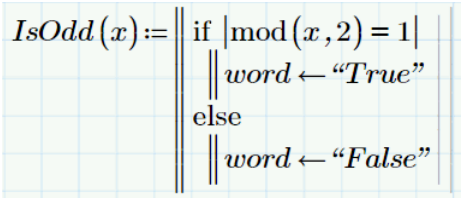
In this course, you will learn the essentials of programming using Mathcad Prime. You will understand how it reinforces Mathcad Prime's units functionality using clear, straightforward instruction and examples.

At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. At the end of the course, you will complete a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.



Course Objectives

- Create a program within the Mathcad worksheet using Mathcad's programming features



Prerequisites

- WBT–3431–A Mathcad Prime 2.0 – Application Orientation

Audience

- This class is intended for the novice or intermediate user of Mathcad.

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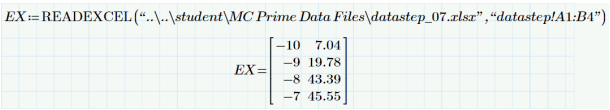
Mathcad Prime 2.0 - Data Exchange and Analysis

Overview

Course Code	WBT-3431-F
Course Length	3 Hours

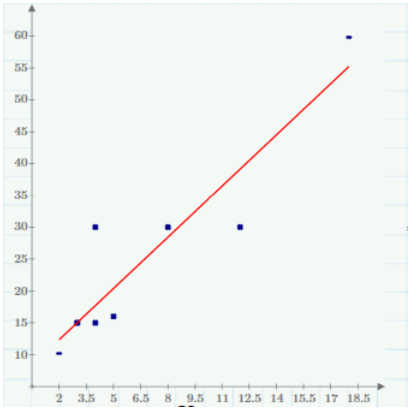


In this course, you will learn the essentials of importing and exporting data, and data analysis using Mathcad Prime. You will understand how it reinforces Mathcad Prime's data exchange and analysis functionality using clear, straightforward instruction and examples.

At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. At the end of the course, you will complete a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.

Course Objectives

- Import and export data
- Smooth, interpolate, and regress data



Prerequisites

- WBT–3431–A Mathcad Prime 2.0 – Application Orientation
- WBT–3431–C Mathcad Prime 2.0 – Plotting

Audience

- This class is intended for the novice or intermediate user of Mathcad.

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Design of Experiments Using Mathcad Prime 2.0

Overview

Course Code	WBT-3604-0
Course Length	2 Hours

This course is designed for users who want to use Mathcad to analyze data resulting from experiments designed to understand the relationship between input variables and response variables in a system or process. In this course, you will learn how to create design matrices, screen factors, perform regression analysis, and perform a Monte Carlo simulation using Mathcad.

Course Objectives

- Understand the basics of experimental design.
- Create design matrices.
- Screen factors.
- Perform a regression analysis.
- Perform a Monte Carlo simulation.

Prerequisites

- Mathcad Prime 2.0 Essentials

Audience

- This course is intended for the intermediate or advanced user of Mathcad.

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Mathcad Prime 2.0 Integration with Creo Parametric

Overview

Course Code	WBT-3605-0
Course Length	2 Hours

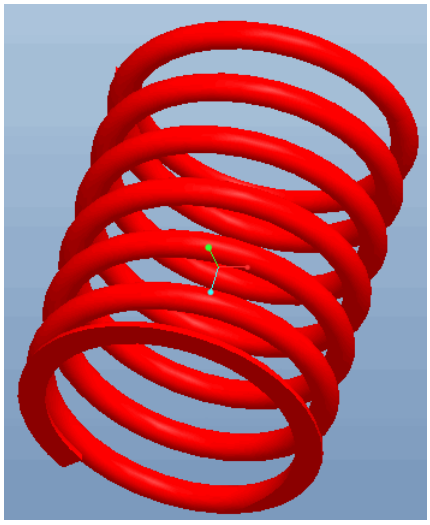
In this course, you will learn how to use Mathcad Prime and Creo Parametric in conjunction with one another. This course is designed for users who are already familiar with both Mathcad Prime and Creo Parametric.

You will complete Pro/FICIENCY skills assessment questions for each topic. These questions are used to help reinforce your understanding of the course topics and form the basis for daily review sessions.

Number of Active Coils:	$Nc := 1$
Diameter of the wire:	$dw := 1 \cdot mm = 0.039\ in$
Force on the spring:	$F := 1 \cdot N = 0.225\ lbf$
Coil diameter:	$Dc := 10 \cdot mm$
Shear modulus:	$G := 77.2 \cdot GPa = (1.12 \cdot 10^{7})\ psi$

Course Objectives

- Understand license and software requirements
- Map variables in Mathcad Prime to receive information from Creo Parametric
- Map variables in Mathcad Prime to return information to Creo Parametric
- Perform a Mathcad analysis in Creo Parametric



Prerequisites

- Mathcad Prime 2.0 Essentials or equivalent experience
- Introduction to Creo Parametric or equivalent experience

Audience

- This course is intended for design engineers and mechanical designers. People in related roles will also benefit from taking this course.

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