



$f_1 := 250 \text{ Hz}$

$$\lambda := \frac{v}{f_1}$$

$\lambda = 1220 \text{ mm}$

v	L
$\left(\frac{m}{s}\right)$	(cm)
400	80.5
405	92
420	95

$$\lambda := 2 \cdot L = \begin{bmatrix} 1.61 \\ 1.84 \\ 1.9 \end{bmatrix} m$$

$$w(t) = \sum_{n=1}^N A_n \cdot \cos(\omega_n \cdot t)$$

$$\omega_n = 2 \cdot \pi \cdot n \cdot f$$

$$L := \frac{1}{2}$$

$$L = 61$$

12



Compare our free and full versions

PTC Mathcad Prime is the industry standard for engineering calculations software, and buying a license gets you access to all the latest product developments and full product functionality.

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	Mathcad Express	Prime 12
PTC Mathcad Capabilities	PTC Mathcad Express	PTC Mathcad Prime (Full License)
Usability		
Write equations using natural math notation	✓	✓
Spell Check	•	✓
Internal and External Hyperlinks in Text	•	✓
Redefinition Warnings	•	✓
Calculate Now in Manual Calculation Mode	•	✓
Required PTC Watermark and Marketing Start Page	✓	•
Basic Math		
Automatic update of calculations	✓	✓
Algebra and trigonometry operators and functions	✓	✓
Unit Support	✓	✓
Advanced Math		
Programming	•	✓
Solve and optimize systems of linear, non-linear, and differential equations	•	✓
Evaluate and analyze expressions and functions symbolically	•	✓
Advanced Engineering Mathematics: e.g. Design of Experiments, Differential Equations, Solving Regression	•	✓
Advanced Numeric Functions: e.g. Fourier Transforms, Signal Processing, Statistics & Data Analysis	•	✓
Choice of solving algorithms, MultiStart, and Optimize for applicable functions	•	✓
Custom Unit Systems	•	✓



PTC Mathcad Capabilities	Mathcad Express	Prime 12
	PTC Mathcad Express	PTC Mathcad Prime (Full License)
Documentation		
Comprehensive documentation	✓	✓
Text Styles	•	✓
Standardize engineering processes using templates	•	✓
Copy Multiple Worksheet Regions to a Word Document	•	✓
Content Protection	•	✓
Equation Wrapping	•	✓
Custom Color Picker	•	✓
Custom Margin, Header & Footer Sizes with custom page numbering, Larger Page Size options	•	✓
Worksheet Background Color Options	•	✓
Plotting		
X-Y plots	Basic Features	✓
Advanced plot types: Polar, Contour, 3D	•	✓
Input/Output		
API Guide	✓	✓
Include worksheet region	•	✓
Excel Component	•	✓
Basic Combo-box Input Control	•	✓
Advanced scripted controls (Python, VBScript, JScript)	•	✓
Insert Object	•	✓

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