

Greek Letters and Special Characters in MATLAB Chart Text

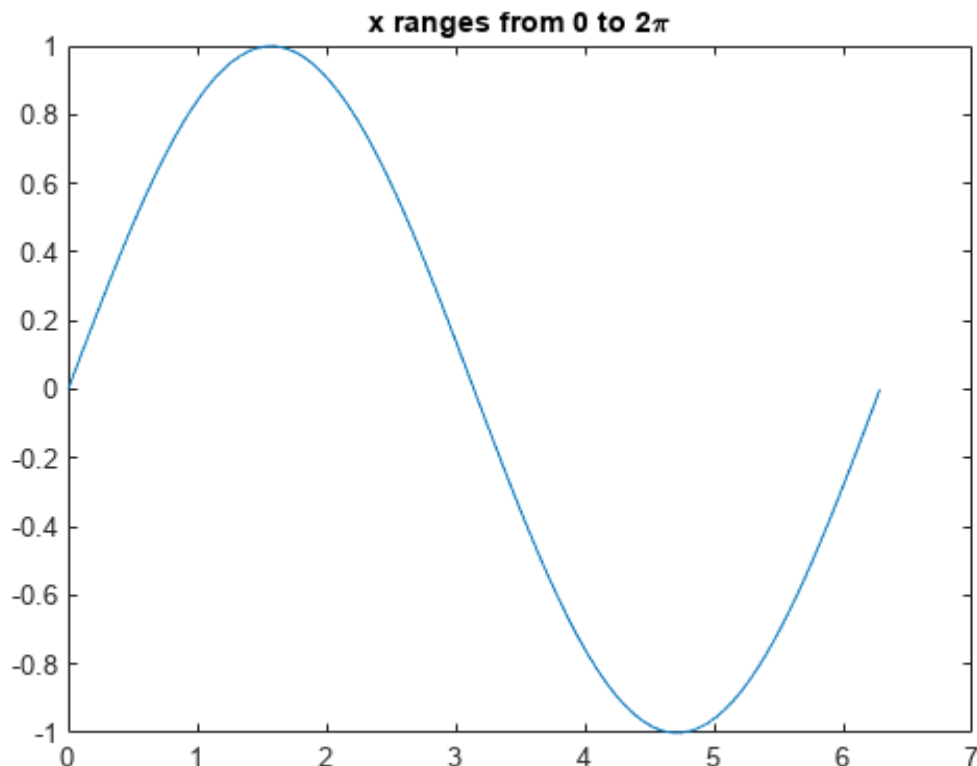
You can add text to a chart that includes Greek letters and special characters using TeX markup. You also can use TeX markup to add superscripts, subscripts, and modify the text type and color. By default, MATLAB[®] supports a subset of TeX markup. To use additional special characters, such as integral and summation symbols, you can use LaTeX markup instead. This example shows how to insert Greek letters, superscripts, and annotations into chart text and explains other available TeX options.

Include Greek Letters

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Create a simple line plot and add a title. Include the Greek letter π in the title by using the TeX markup `\pi`.

```
x = linspace(0,2*pi);  
y = sin(x);  
plot(x,y)  
title('x ranges from 0 to 2\pi')
```

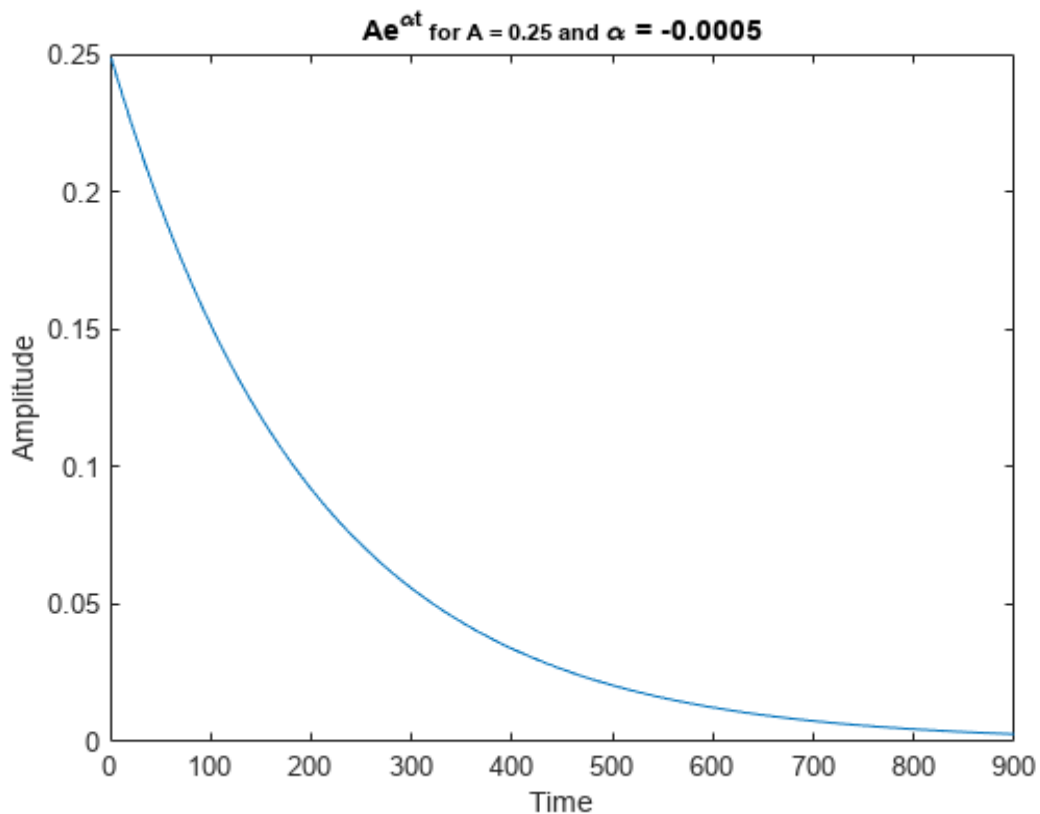


Include Superscripts and Annotations

Create a line plot and add a title and axis labels to the chart. Display a superscript in the title using the `^` character. The `^` character modifies the character immediately following it. Include multiple characters in the superscript by enclosing them in curly braces `{}`. Include the Greek letters α and μ in the text using the TeX markups `\alpha` and `\mu`, respectively.

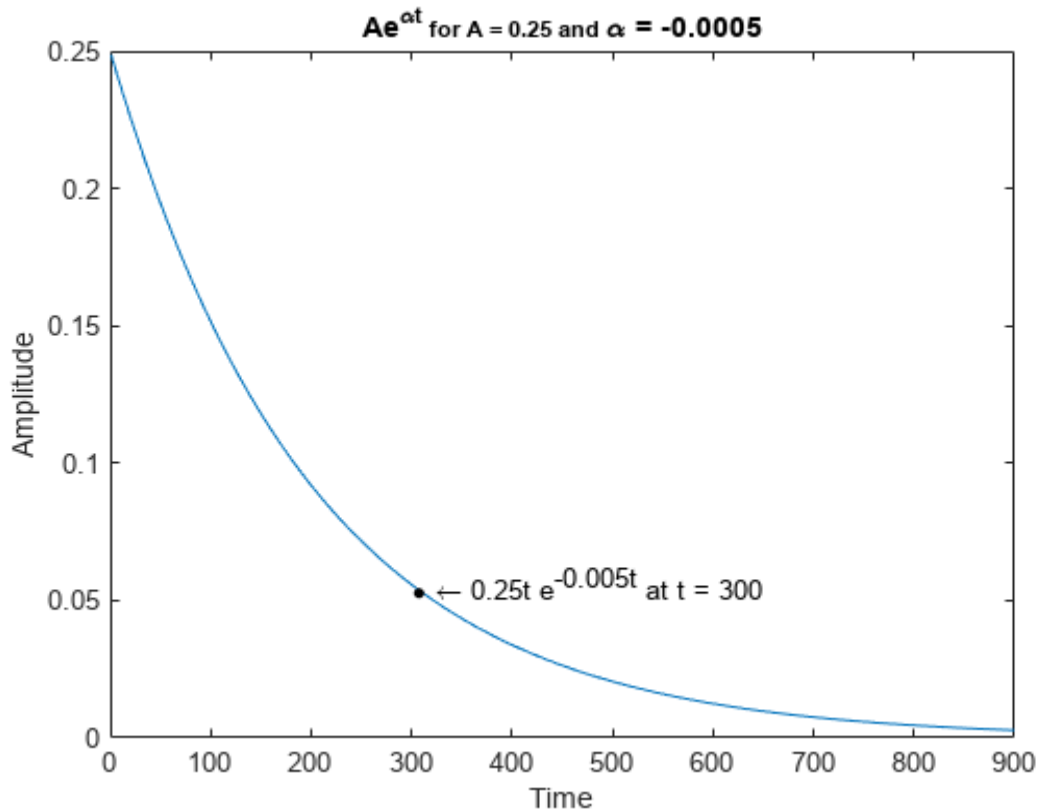
```
t = 1:900;
y = 0.25*exp(-0.005*t);

figure
plot(t,y)
title('Ae^{\alpha} for A = 0.25 and \alpha = -0.0005')
xlabel('Time')
ylabel('Amplitude')
```



Add text at the data point where $t = 300$. Use the TeX markup `\bullet` to add a marker to the specified point and use `\leftarrow` to include an arrow pointing to the left. By default, the specified data point is to the left of the text.

```
txt = '\bullet \leftarrow 0.25t e^{-0.005t} at t = 300';
text(t(300),y(300),txt)
```



TeX Markup Options

MATLAB supports a subset of TeX markup. Use TeX markup to add superscripts and subscripts, modify the text type and color, and include special characters. MATLAB interprets the TeX markup as long as the **Interpreter** property of the text object is set to **'tex'** (the default).

Modifiers remain in effect until the end of the text. Superscripts and subscripts are an exception because they modify only the next character or the characters within the curly braces. When you set the interpreter to **'tex'**, the supported modifiers are as follows.

Modifier	Description	Example
$\wedge\{ \}$	Superscript	'text ^{superscript} '
$_ \{ \}$	Subscript	'text _{subscript} '
\bf	Bold font	'\bf text'
\it	Italic font	'\it text'
\sl	Oblique font (usually the same as italic font)	'\sl text'
\rm	Normal font	'\rm text'
$\fontname\{specifier\}$	Font name — Replace <i>specifier</i> with the name of a font family. You can use this in combination with other modifiers.	'\fontname{Courier} text'

Modifier	Description	Example
<code>\fontsize{specifier}</code>	Font size — Replace <i>specifier</i> with a numeric scalar value in point units.	' <code>\fontsize{15} text</code> '
<code>\color{specifier}</code>	Font color — Replace <i>specifier</i> with one of these colors: red, green, yellow, magenta, blue, black, white, gray, darkGreen, orange, or lightBlue.	' <code>\color{magenta} text</code> '
<code>\color[rgb]{specifier}</code>	Custom font color — Replace <i>specifier</i> with a three-element RGB triplet.	' <code>\color[rgb]{0,0.5,0.5} text</code> '

This table lists the supported special characters for the 'tex' interpreter.

Character Sequence	Symbol	Character Sequence	Symbol	Character Sequence	Symbol
<code>\alpha</code>	α	<code>\upsilon</code>	υ	<code>\sim</code>	~
<code>\angle</code>	∠	<code>\phi</code>	φ	<code>\leq</code>	≤
<code>\ast</code>	*	<code>\chi</code>	χ	<code>\infty</code>	∞
<code>\beta</code>	β	<code>\psi</code>	ψ	<code>\clubsuit</code>	♣
<code>\gamma</code>	γ	<code>\omega</code>	ω	<code>\diamondsuit</code>	♦
<code>\delta</code>	δ	<code>\Gamma</code>	Γ	<code>\heartsuit</code>	♥
<code>\epsilon</code>	ε	<code>\Delta</code>	Δ	<code>\spadesuit</code>	♠
<code>\zeta</code>	ζ	<code>\Theta</code>	Θ	<code>\leftrightarrow</code>	↔
<code>\eta</code>	η	<code>\Lambda</code>	Λ	<code>\leftarrow</code>	←
<code>\theta</code>	θ	<code>\Xi</code>	Ξ	<code>\Leftarrow</code>	⇐
<code>\vartheta</code>	ϑ	<code>\Pi</code>	Π	<code>\uparrow</code>	↑
<code>\iota</code>	ι	<code>\Sigma</code>	Σ	<code>\rightarrow</code>	→
<code>\kappa</code>	κ	<code>\Upsilon</code>	Υ	<code>\Rightarrow</code>	⇒
<code>\lambda</code>	λ	<code>\Phi</code>	Φ	<code>\downarrow</code>	↓
<code>\mu</code>	μ	<code>\Psi</code>	Ψ	<code>\circ</code>	◦
<code>\nu</code>	ν	<code>\Omega</code>	Ω	<code>\pm</code>	±
<code>\xi</code>	ξ	<code>\forall</code>	∀	<code>\geq</code>	≥
<code>\pi</code>	π	<code>\exists</code>	∃	<code>\propto</code>	∝

Character Sequence	Symbol	Character Sequence	Symbol	Character Sequence	Symbol
<code>\rho</code>	ρ	<code>\ni</code>	\ni	<code>\partial</code>	∂
<code>\sigma</code>	σ	<code>\cong</code>	\cong	<code>\bullet</code>	\bullet
<code>\varsigma</code>	ς	<code>\approx</code>	\approx	<code>\div</code>	\div
<code>\tau</code>	τ	<code>\Re</code>	\Re	<code>\neq</code>	\neq
<code>\equiv</code>	\equiv	<code>\oplus</code>	\oplus	<code>\aleph</code>	\aleph
<code>\Im</code>	\Im	<code>\cup</code>	\cup	<code>\wp</code>	\wp
<code>\otimes</code>	\otimes	<code>\subseteq</code>	\subseteq	<code>\oslash</code>	\oslash
<code>\cap</code>	\cap	<code>\in</code>	\in	<code>\supseteq</code>	\supseteq
<code>\supset</code>	\supset	<code>\lceil</code>	\lceil	<code>\subset</code>	\subset
<code>\int</code>	\int	<code>\cdot</code>	\cdot	<code>\o</code>	\circ
<code>\rfloor</code>	\rfloor	<code>\neg</code>	\neg	<code>\nabla</code>	∇
<code>\lfloor</code>	\lfloor	<code>\times</code>	\times	<code>\ldots</code>	\dots
<code>\perp</code>	\perp	<code>\surd</code>	\surd	<code>\prime</code>	$'$
<code>\wedge</code>	\wedge	<code>\varpi</code>	ϖ	<code>\emptyset</code>	\emptyset
<code>\rceil</code>	\rceil	<code>\rangle</code>	\rangle	<code>\mid</code>	$ $
<code>\vee</code>	\vee	<code>\langle</code>	\langle	<code>\copyright</code>	\copyright

Create Text with LaTeX

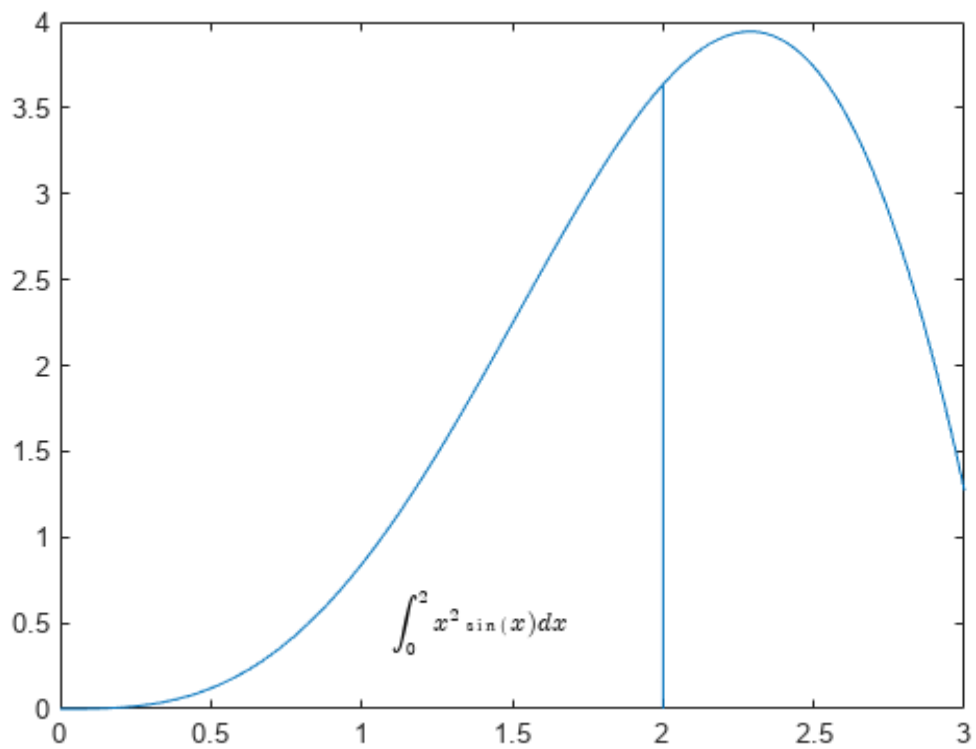
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By default, MATLAB interprets text using **TeX markup**. However, for more formatting options, you can use **LaTeX markup** instead.

For example, plot $y=x^2\sin(x)$ and draw a vertical line at $x=2$. Add text to the graph that contains an integral expression using LaTeX markup. To show the expression in display mode, surround the markup with double dollar signs ($\$$). When you call the `text` function, set the **Interpreter** property to `'latex'`.

```
x = linspace(0,3);
y = x.^2.*sin(x);
plot(x,y)
line([2,2],[0,2^2*sin(2)])

str = '$$ \int_{0}^{2} x^2\sin(x) dx $$';
text(1.1,0.5,str,'Interpreter','latex')
```

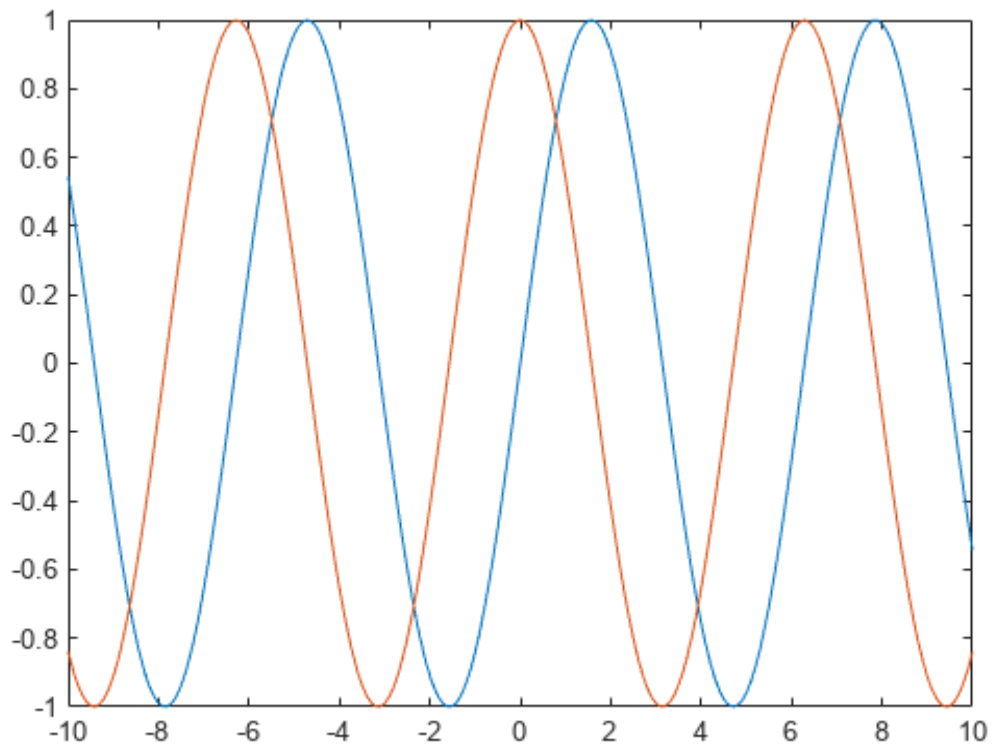


Create Plot Titles, Tick Labels, and Legends with LaTeX

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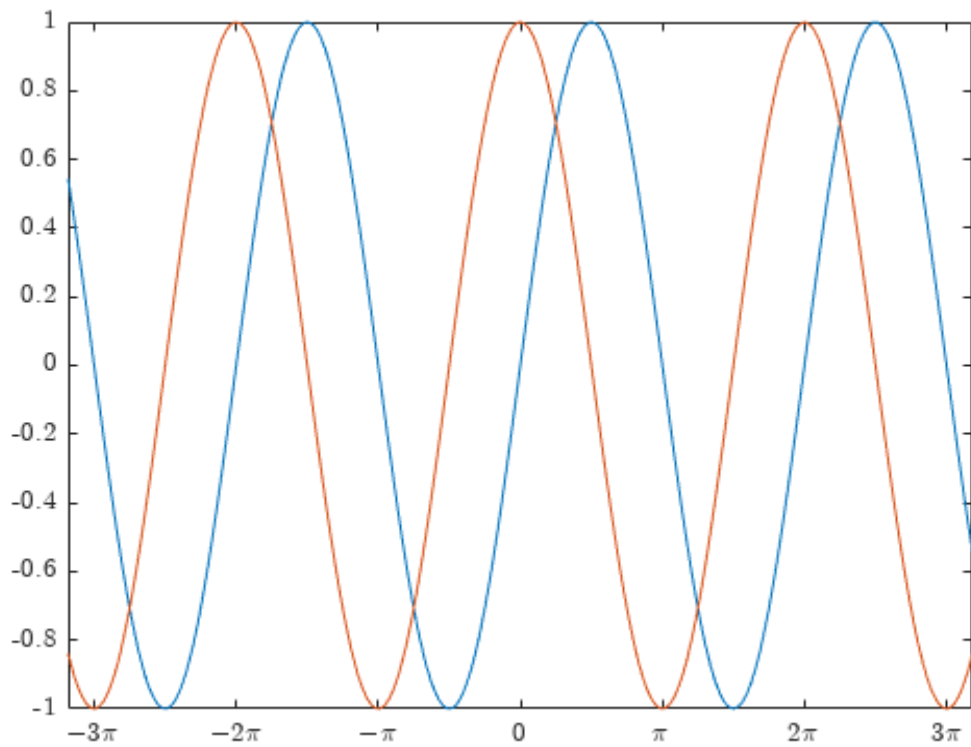
You can use [LaTeX markup](#) in plot titles, tick labels, and legends. For example, create a plot of a sine wave and a cosine wave.

```
x = -10:0.1:10;  
y = [sin(x); cos(x)];  
plot(x,y)
```



Set the x-axis tick values to be multiples of π by calling the `xticks` function. Then, call the `gca` function to get the current axes, and set the `TickLabelInterpreter` property to `'latex'`. Specify the tick labels using LaTeX markup. For inline expressions, surround the markup with single dollar signs ($\$$).

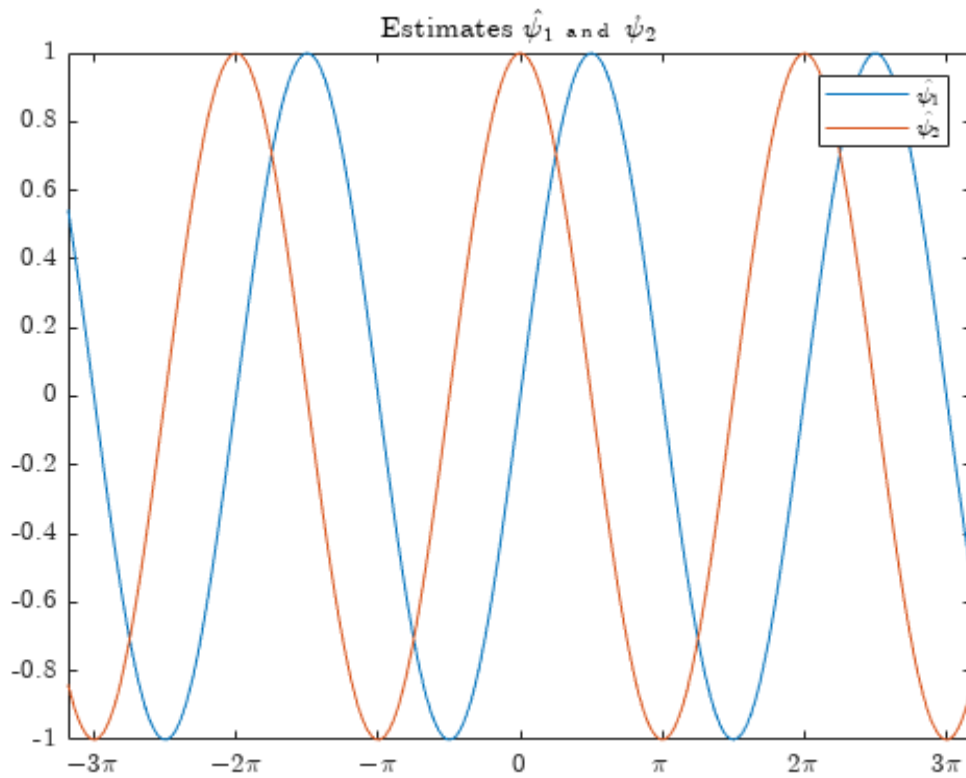
```
xticks([-3*pi -2*pi -pi 0 pi 2*pi 3*pi])
ax = gca;
ax.TickLabelInterpreter = 'latex';
xticklabels({' $-3\pi$ ', ' $-2\pi$ ', ' $-\pi$ ', '0',
' $\pi$ ', ' $2\pi$ ', ' $3\pi$ '});
```



Add a title that includes LaTeX markup by calling the `title` function and setting the `Interpreter` property to `'latex'`. Similarly, create a legend with labels that include LaTeX markup.

```
% Add title
str = '\hat{\psi}_1$ and \hat{\psi}_2$';
title(str,'Interpreter','latex')

% Add legend
label1 = '\hat{\psi}_1$';
label2 = '\hat{\psi}_2$';
legend(label1,label2,'Interpreter','latex')
```

See Also

[text](#) | [plot](#) | [title](#) | [xlabel](#) | [ylabel](#)

Related Topics

- [Add Title and Axis Labels to Chart](#)
- [Add Text to Chart](#)

External Websites

- <https://www.latex-project.org/>