

<code>-stderrWindow</code>	send <code>stderr</code> to a popup window instead of a terminal
<code>-style s</code>	specify the widget style used by the front end
<code>-topDirectory dir</code>	specify the location of the <i>Mathematica</i> installation directory
<code>-version</code>	print the current version of the front end on the command line

`mathematica` command-line options.

The default for `-backgroundTaskDelay` is 100 milliseconds.

The option `-cleanStart` will ignore the caches stored in the directory `$UserBaseDirectory/FrontEnd/7.0_Caches`, and will rebuild the front end preferences file, `$UserBaseDirectory/FrontEnd/init.m`. This option can also be abbreviated as `-clean`.

When using `-font`, a list of possible font names can be found by using `xfontsel`. The name can be expressed either as an X Logical Font Description or as a valid font alias.

The option `-lmverbose` is useful for debugging problems related to the license server

The option `-mathlink` may be useful when the front end is used as a typesetting or graphics rendering service. See www.wolfram.com/solutions/mathlink for additional information about *MathLink*.

The default directory for `-preferencesDirectory` is `~/.Mathematica`.

The option `-singleLaunch` will prohibit multiple front end launches only if the current front end was launched with the `-singleLaunch` option.

Valid styles for `-style` are `motif`, `motifplus`, `windows`, `cde`, `platinum`, `sgi`, and `compact`.

The default location for `-topDirectory` is `/usr/local/Wolfram/Mathematica/7.0`.

Testing the Installation on Unix and Linux

The following simple commands allow you to test the installation of *Mathematica*. Running these commands does not guarantee that the installation was successful, but a failed command can indicate that a serious problem occurred during installation.

You should run these tests from a regular user account and not from an account with administrator privileges.

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

If you run into problems when doing these tests, see the troubleshooting tips in "Troubleshooting on Unix and Linux". If you do not find the answer there, check the Technical Support website at support.wolfram.com/mathematica.

To Test the Kernel:

1. To start the kernel, type `math` in a shell and press `Enter`.

```
In[1]:=
```

2. Type `N[Pi, 20]` and press `Enter`. The number in the output should match the output shown here.

```
In[1]:= N[Pi, 20]
```

```
Out[1]= 3.1415926535897932385
```

```
In[2]:=
```

3. To exit the kernel, type `Exit` and press `Enter`.

On Unix and Linux, you can test the kernel on a remote machine by using the command `ssh hostname /usr/local/bin/math`. (The exact pathname could be different depending on how *Mathematica* was installed.) This command will launch the kernel on the remote machine *hostname*. When you see the `In[1]` label, follow step 2 and step 3 in the previous instructions.

To Test the Front End:

1. Make sure that you are running X. Launch *Mathematica* by typing `mathematica` in a shell and pressing `Enter`.

Alternatively, you can select **Mathematica** from the menu folder **Wolfram**.

A splash screen with initialization information appears briefly, after which an empty notebook and the **Welcome Screen** appear.

2. Type `N[Pi,20]`. Then hold down the `Shift` key and press `Enter` to evaluate. This should send the command to the kernel and return the same result as before. The `In[1]` and `Out[1]` labels are prepended once the evaluation is completed.

In the notebook window, there should be a horizontal line across the notebook; this is the horizontal insertion bar. If you do not see one, move the pointer until it becomes a horizontal I-beam and click once to see the insertion bar.

3. Press the **Esc** key. You should see three small horizontal lines in a column (ε). Type `int` and press **Esc** again. You should see an integral sign (\int). As an additional font check, typing `\[CheckmarkedBox]` and `\[CirclePlus]` should print the symbols \boxtimes and \oplus , respectively. If the symbols show up correctly, the fonts have been properly installed.
4. From the **Help** menu, choose **Documentation Center**. The *Mathematica* Documentation Center should appear.

On Unix and Linux, you can test the X front end remotely, provided the ssh server on the remote machine allows X forwarding. You must be running X on the local machine to do this. In a shell, type `ssh -X hostname /usr/local/bin/mathematica`. (The exact pathname could be different depending on how *Mathematica* was installed.) This command will launch *Mathematica* on the remote machine *hostname*. When the splash screen appears on your screen, follow step 2 and step 3 in the previous instructions.

Configuration Files on Unix and Linux

Mathematica stores preference settings and initialization data in two directories, `$BaseDirectory` and `$UserBaseDirectory`. Within each of these directories are several possible subdirectories with titles such as `FrontEnd`, `Kernel`, and `Licensing`.

- Global settings that affect all users are stored in subdirectories of the directory `$BaseDirectory`. The default value of `$BaseDirectory` on Unix and Linux is `/usr/share/Mathematica`. To redefine the location of global preference settings and initialization data, set the environment variable `MATHEMATICA_BASE`.
- Settings that only affect a particular user are stored in subdirectories of the directory `$UserBaseDirectory`, which is typically a subdirectory of the user's home directory. The default value of `$UserBaseDirectory` on Unix and Linux is `~/.Mathematica`. To redefine the location of user preferences and initialization data, set the environment variable `MATHEMATICA_USERBASE`.

Settings in the directory `$UserBaseDirectory` override global settings defined in the directory `$BaseDirectory`.

In the pathnames that follow, replace the variables `$BaseDirectory` and `$UserBaseDirectory` with the appropriate directories for your system. To find their locations on your system, evaluate the command `$BaseDirectory` (or `$UserBaseDirectory`) in a *Mathematica* notebook.

Kernel

The initialization files used by the kernel contain *Mathematica* commands that are evaluated at startup, such as function definitions, packages to load, or kernel option settings. These commands are also available to the *Mathematica* front end.

```
$BaseDirectory/Kernel/init.m
```

This file is used to initialize the kernel and therefore should store any kernel commands that are appropriate for all users running the kernel.

```
$UserBaseDirectory/Kernel/init.m
```

This file stores user-specific commands used to initialize the kernel.

Kernel initialization files are not created automatically.

Front End

Front end initialization files store preference settings such as the values of global options in the Option Inspector. These files are automatically updated by *Mathematica* when you change a setting in the front end. To make changes to this file, make your changes from within *Mathematica* rather than editing the file directly.

```
$BaseDirectory/FrontEnd/init.m
```

This file stores systemwide defaults used by all *Mathematica* front ends. The settings in this file affect all users. "Systemwide Defaults on Unix and Linux" explains how to implement changes to this global file.

```
$UserBaseDirectory/FrontEnd/init.m
```

This file defines settings within the front end that are specific to each user.

```
$UserBaseDirectory/FrontEnd/7.0_Caches/
```

This directory within the user's home directory stores information on system settings that are read by the front end.

Front end initialization files are created automatically.

Passwords

Passwords are stored in the `mathpass` file, described in further detail in "Registration and Passwords". In the following pathname, replace the variable `$InstallationDirectory` with the directory where you installed *Mathematica*. The default value of `$InstallationDirectory` on Unix and Linux is `/usr/local/Wolfram/Mathematica/7.0`. To find the value of `$InstallationDirectory` on your system, evaluate the command `$InstallationDirectory` in a *Mathematica* notebook.

```
$BaseDirectory/Licensing/mathpass
```

This is the default location for the global password file.

```
$InstallationDirectory/Configuration/Licensing/mathpass
```

This is an alternative location for the global password file.

```
$UserBaseDirectory/Licensing/mathpass
```

While this is not normally the location for the password file, a user-specific `mathpass` file can be stored here.

Systemwide Defaults on Unix and Linux

If you have installed *Mathematica* in a location where multiple users run it (for example, on a file server or multi-user machine), then you can set up systemwide defaults for the *Mathematica* front end and kernel. This is ideal for setting up *Mathematica* for use in computer labs and classrooms. If you share the directory `$BaseDirectory` across the network, these defaults will also take effect on local installations that use the shared `$BaseDirectory`.

The following instructions assume that `$BaseDirectory` and `$UserBaseDirectory` have their default values, `/usr/share/Mathematica` and `~/.Mathematica` respectively.

To Set Up a Configuration File for the Front End:

1. Launch *Mathematica*, and set up any changes to the front end that you need. For example, you may want to modify default file locations, language options, or menu settings.
2. Quit *Mathematica*.
3. Copy the file `~/.Mathematica/FrontEnd/init.m` to the directory `/usr/share/Mathematica/FrontEnd`.

These settings will now be used by the front end unless overridden by the local `init.m` file stored in the user's directory `~/.Mathematica/FrontEnd`.

To Set Up a Configuration File for the Kernel:

1. Launch *Mathematica*, and create a new file.
2. Add any *Mathematica* commands that should be evaluated on startup. For example, you may want to add a function definition or display a message at startup. Enter all the commands in the same cell, separating commands with semicolons.

3. Make this cell an initialization cell by selecting the cell bracket and then choosing **Cell ▶ Cell Properties ▶ Initialization Cell**.
4. When you have finished making your changes, choose **File ▶ Save** and select **Mathematica Package** from the **Save as type** popup menu. Then save the file as `/usr/share/Mathematica/Kernel/init.m`.

These commands will be evaluated when users launch *Mathematica*. If you added a function definition, that function will be available to all users.

Fonts on Unix and Linux

Dealing with fonts under Unix and Linux can sometimes be tricky. The important issues in dealing with fonts in *Mathematica* are presented here for your convenience.

Font Formats

The *Mathematica* front end supports BDF, TrueType, and Type1 fonts. These fonts are automatically installed by `MathInstaller` during installation.

Font Installation

All machines that display the front end must have access to the fonts included with *Mathematica*. If the *Mathematica* process is running on a remote machine and the front end is displayed on the local machine, the X server on the local machine must know where to find the *Mathematica* fonts. To do this, add the *Mathematica* fonts to the local font path by running a command like the following on the local machine.

```
xset fp+ /usr/local/Wolfram/Mathematica/7.0/SystemFiles/Fonts/Type1; xset fp rehash
```

Be sure to execute `xset fp rehash` to make the fonts available to the local X server.

For optimal onscreen performance, Type1 fonts should appear before BDF fonts in the font path. Hence, `$InstallationDirectory/SystemFiles/Fonts/Type1` should appear before `$InstallationDirectory/SystemFiles/Fonts/BDF`. You can check the order of the font path by executing the command `xset q`.

Note: TrueType fonts are automatically loaded and do not require an `xset` command.

Font Servers

You may prefer not to install local copies of the *Mathematica* fonts on all machines. You can instead set up a font server with all the necessary *Mathematica* fonts. The other machines on the network can then find the fonts as needed by reading them from the *Mathematica* directory on the font server. Consult your operating system's documentation for further information.

Common Font Errors

On some systems, the font path is limited in length, and it is possible to receive `xset: bad font path element` errors even if the fonts are available to the server. In this case, try reordering the font path and adding the directories for the *Mathematica* fonts earlier in the path. The directory `$InstallationDirectory/SystemFiles/Fonts/Type1` must be listed before `$InstallationDirectory/SystemFiles/Fonts/BDF` on the font path for optimal onscreen performance.

Fonts and Printing

When the X front end prints a notebook, it uses AFM files for the font metrics needed for printing. If you want to print using a particular font not included with *Mathematica*, you will need the AFM files for the font. These files are installed in either `$InstallationDirectory/Configuration/Fonts/AFM`, `/usr/lib/AFM`, or `/usr/lib/afm`. Fonts are normally downloaded to the printer by the front end when printing. You may be able to download the fonts and store them on the printer. See the documentation and programs that came with your printer for more information.

GhostScript

If you want to view *Mathematica* graphics using GhostScript, you need to make GhostScript aware of the *Mathematica* fonts. For more information, contact Technical Support by sending email to support@wolfram.com, or visit support.wolfram.com/mathematica/graphics/export/ghostscript.html.

Troubleshooting on Unix and Linux

If you have problems using *Mathematica* on Unix or Linux, check this list for solutions.

CD or DVD

- Make sure the CD or DVD is properly mounted with the correct `mount` command (see "Mounting a CD or DVD on Unix and Linux"). If the filenames on the CD/DVD appear in the wrong case, it means the CD/DVD is mounted incorrectly.

Installation

Make sure to run the installer from the directory in which it is located.

Passwords

If the front end password dialog box appears when you launch *Mathematica*, either *Mathematica* could not locate the `mathpass` file or there was no valid password in the `mathpass` file. To resolve this problem, first check that there is a `mathpass` file in one of these directories: `/usr/share/Mathematica/Licensing`, `$InstallationDirectory/Configuration/Licensing`, or `~/.Mathematica/Licensing`. If you did not find a `mathpass` file in these locations, follow the instructions in "Entering a Single-Machine Password" to reenter your password.

If there is a `mathpass` file in one of those directories, the password or passwords are invalid. Make sure that your MathID number matches the MathID number used to issue your password. If your MathID number changes, you will need to contact Customer Service to get a new password. Contact information is provided in "Registration and Passwords".

Paths

Front End Preferences

Front end preferences, such as the names of recently opened and saved files, are stored in `~/.Mathematica/FrontEnd`. The most convenient way to reset the front end preferences to their default values is to restart *Mathematica* using the command `mathematica -cleanStart`. This will cause the initialization file to be rebuilt automatically.

Caches

Information about your *Mathematica* layout, such as the locations of text resource files, is stored in caches. These caches are located in the directory `~/.Mathematica/FrontEnd/7.0_Caches`. A corrupted cache may cause the front end to produce an error or quit immediately on startup. The most convenient way to reset the caches to their default values is to use the option `-cleanStart` at startup. This will cause the *Mathematica* caches and the initialization file to be rebuilt automatically. If you want to rebuild your caches but retain your preferences, hold down **Shift** during startup. This will delete and rebuild the cache without rebuilding the front end initialization file.

Fonts

- Make sure that the fonts are installed on the machine that displays the front end or on a font server.
- If you see the error `xset: bad font path element`, either the fonts are not properly installed on your machine, or your font path is too long and exceeds the allowable limit. Make sure the fonts are properly installed, or copy the fonts to a directory that is already on the font path.

Technical Support

For further assistance, check the Technical Support FAQs on the web at support.wolfram.com. If you are a Site License Administrator, additional Site License Documentation is available at site.wolfram.com. If you do not find the information you need, please contact Technical Support by sending email to support@wolfram.com or by calling +1-217-398-6500. Include your license number in all correspondence. Your license number is located on your electronic or printed license certificate. It is also available after installation by going to the **Help** menu and clicking **About Mathematica**. You must be a registered user in order to receive installation support. You must have a current *Premier Service* subscription to receive Technical Support.

Mac OS X

Installing Mathematica on Mac OS X

Installing Mathematica for Network Licenses

Requirements

Mathematica is available for Windows, Unix, Linux, and Mac OS X. For a complete list of platform availability, visit www.wolfram.com/products/mathematica/platforms.html. Any supported machine can act as a client for running *Mathematica*, provided the following two conditions are met:

- The client has access to the *Mathematica* files, either locally or from a file server on the network.
- The license server running *MathLM* is available on the TCP/IP network.

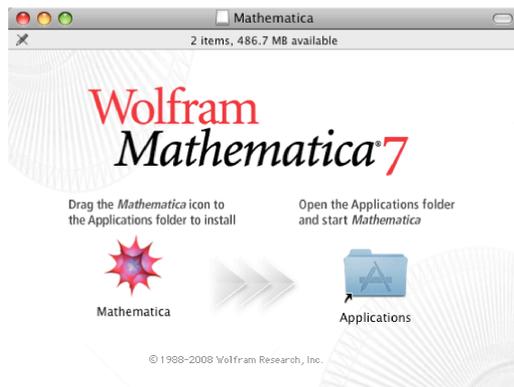
A license server can also function as its own client. However, this is not recommended. If the machine has to be rebooted for any reason, the serving of licenses to all other clients on the network may be disrupted.

Before you install *Mathematica* as a license server client, *MathLM* should already be installed and running on a license server on the network (see "Installing *MathLM*" for details). To complete the *Mathematica* installation, you will need to know the name or IP address of the license server running *MathLM*.

To install *Mathematica* on Mac OS X in the Applications folder, you must log on as administrator.

To Install *Mathematica*:

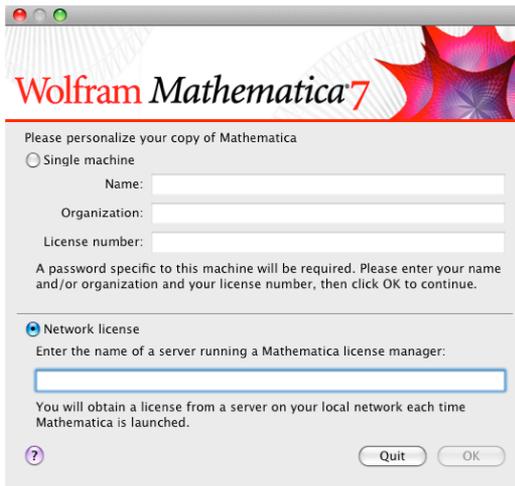
1. Insert the DVD. A new window appears on your screen.



2. Drag the *Mathematica* icon from this window to the location on your hard drive where you want to install *Mathematica*. In order for all users to have access to *Mathematica*, you should install it in the systemwide Applications folder. You must have administrative privileges to do this.

Note: If you are installing over a previous version of *Mathematica*, your existing math-pass file and custom settings will **not** be deleted.

3. When all files have been copied, launch *Mathematica* by opening the folder where you installed *Mathematica* and double-clicking the *Mathematica* icon.
4. *Mathematica* starts up and the following dialog box appears. Select **Network license**. Then enter the name or IP address of the *MathLM* license server in the text field provided.



5. Click **OK**. *Mathematica* launches and is ready for use.

After you install *Mathematica* you can place the *Mathematica* icon into the Dock for easier access. To do this, start *Mathematica*, and hold down the **Ctrl** key while clicking the *Mathematica* icon in the Dock. In the popup menu that appears, choose **Keep in Dock**.

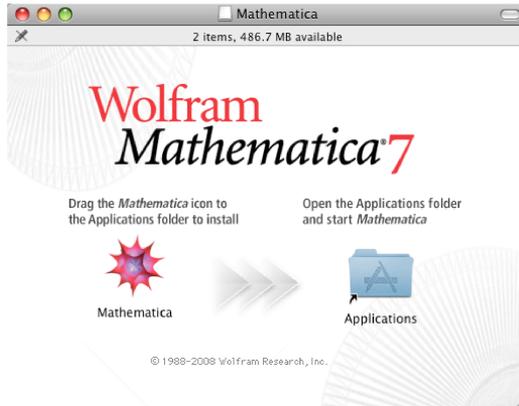
Installing Mathematica for Single-Machine Licenses

Follow these instructions to install a standalone copy of *Mathematica* that does not get a license from the license server. Depending on your license type, this may require contacting Wolfram Research to purchase additional licenses.

To run *Mathematica*, you must register with Wolfram Research and receive a password. See "Registration and Passwords" for further information.

To Install a Single-Machine Copy of *Mathematica* on Mac OS X:

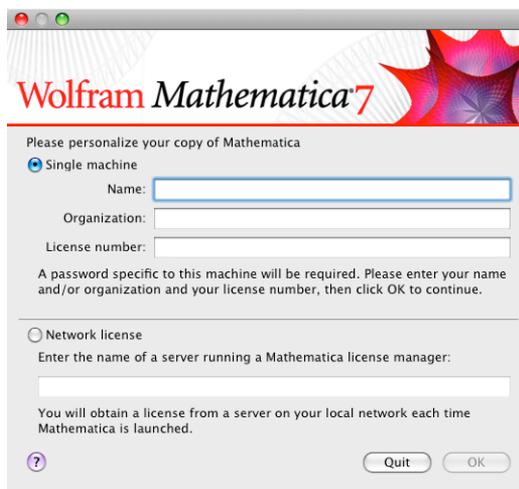
1. Insert the *Mathematica* DVD. A new window appears on your screen.



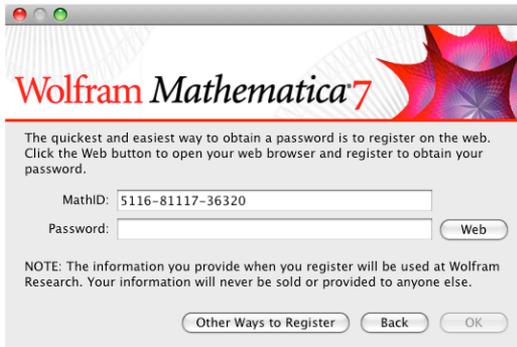
2. Drag the *Mathematica* icon from the window to the location on your hard drive where you want to install *Mathematica*.

Note: If you are installing over a previous version of *Mathematica*, your existing math-pass file and custom settings will **not** be deleted.

3. When all files have been copied, launch *Mathematica* by opening the folder where you installed *Mathematica* and double-clicking the *Mathematica* icon.
4. *Mathematica* starts up and the following dialog box appears. Select **Single machine**. Enter your name, the name of your organization, and your license number (located on your electronic or printed certificate) in the text fields provided. Click **OK** when you are done.



- The following dialog box appears showing the MathID number for your machine. To obtain your password, click the **Web** button, go to register.wolfram.com, or contact Wolfram Research (see "Registration and Passwords" for further information). You will need to supply your license number and your MathID number.



- Enter your password and click **OK**. You are now ready to start using *Mathematica*.

Installing Mathematica from a File Server

One convenient way to install *Mathematica* on a client is to copy the files from a file server on the network. This is an efficient way of making *Mathematica* available to a large number of users without having to supply a DVD to each user.

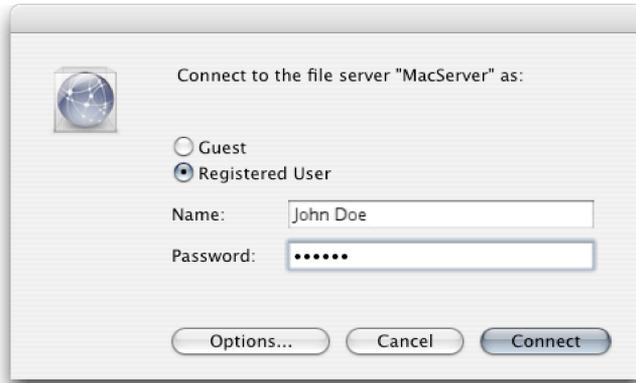
Before following these instructions, *Mathematica* should be installed on the file server according to the instructions in "Network License" and "Single-Machine License".

To Install *Mathematica* from a File Server:

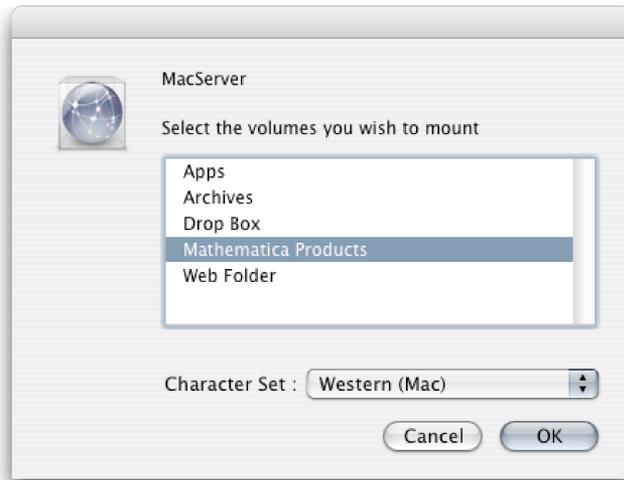
- On the client machine, select **Go ► Connect to Server** in the **Finder** menu.
- In the dialog box that appears, choose a file server from the list or enter the machine name or IP address of the file server in the text field. Then click **Connect**.



3. Enter your name and password in the dialog box that appears. Then click **Connect**.



4. A dialog box appears, showing a list of volumes on the file server. Select the volume in which *Mathematica* is installed. Then click **OK**.



5. The volume you selected is mounted on the client machine. Double-click the icon representing the volume.
6. Navigate to the location where *Mathematica* is installed. Then drag the *Mathematica* package from the file server to the location on the client machine where you want to install *Mathematica*. In order for all users to have access to *Mathematica*, you should install it in the Applications folder. You must log on as administrator to do this.

Launching Mathematica on Mac OS X

Launching Mathematica Locally

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

To Launch *Mathematica*:

Double-click the *Mathematica* icon in the directory where *Mathematica* is installed. Alternatively, if you have placed the *Mathematica* icon in the dock, single-click the icon.

To Launch Only the *Mathematica* Kernel:

Open the **Terminal** application and type the full pathname of the **MathKernel** binary in the window that appears. For example, if you installed *Mathematica* in the **Applications** folder, type `/Applications/Mathematica.app/Contents/MacOS/MathKernel` in a **Terminal** window and press `Return`.

Launching Mathematica from a File Server

To maintain a centralized location for preferences and password files or to save disk space, you can run *Mathematica* directly from a file server. To do this, the client machine does not need to have any *Mathematica* files installed locally.

To Run a Copy of *Mathematica* Installed on a Remote File Server:

1. Connect to a file server on which *Mathematica* is installed.
2. Double-click the icon representing the volume with the *Mathematica* files. Then navigate to the location where *Mathematica* is installed.
3. Double-click the *Mathematica* icon in the directory where *Mathematica* is installed.

Mathematica Command-Line Options

The commands `MathKernel` and `Mathematica` have several command-line options used to specify certain configuration information and file locations.

`MathKernel`

The command `MathKernel` starts the kernel, which is the part of *Mathematica* that handles calculations. This command is also used by the *Mathematica* front end.

<code>-initfile file</code>	Specifies the name of a file containing commands to be run on startup.
<code>-lmverbose</code>	Prints diagnostic information to <code>stderr</code> on connecting to the license manager. This is useful for debugging problems related to the license server.
<code>-mathlink</code>	Specifies that the kernel should be run in <i>MathLink</i> mode. See www.wolfram.com/solutions/mathlink for additional information about <i>MathLink</i> .
<code>-noinit</code>	Specifies that no initialization file should be read at startup.
<code>-password str</code>	Specifies a password to use instead of the password or passwords stored in the <code>mathpass</code> file. The password should have the form " <code>!servername</code> " or " <code>machinename mathid licensenumber password</code> ".
<code>-pwfile file</code>	Specifies the name of a file that has a valid password.
<code>-run</code>	Takes a command to be run on startup as an argument.

MathKernel command-line options.

Mathematica

The command `Mathematica` runs the *Mathematica* front end. In order to run *Mathematica* with a command-line option, you must start it from the command line using the **Terminal** application.

<code>-cleanStart</code>	Tells the front end to ignore caches stored in the directory <code>~/Library/Mathematica/FrontEnd/7.0 Caches</code> , and rebuilds the front end preferences file, <code>~/Library/Mathematica/FrontEnd/init.m</code> .
<code>-mathlink</code>	Causes the front end to run in <i>MathLink</i> mode. In <i>MathLink</i> mode, the front end runs as a child process that is capable of accepting <i>MathLink</i> packets. This option may be useful when the front end is used as a typesetting or graphics rendering service.
<code>-preferencesDirectory dir</code>	Specifies the location where preference settings are stored. The default location is <code>~/Library/Mathematica</code> .
<code>-topDirectory dir</code>	Specifies the location of the <i>Mathematica</i> installation directory.

Mathematica command-line options.

Testing the Installation on Mac OS X

The following simple commands allow you to test the installation of *Mathematica*. Running these commands does not guarantee that the installation was successful, but a failed command can indicate that a serious problem occurred during installation.

You should run these tests from a regular user account and not from an account with administrator privileges.

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

If you run into problems when doing these tests, see the troubleshooting tips in "Troubleshooting on Mac OS X". If you do not find the answer there, check the Technical Support website at support.wolfram.com/mathematica.

To Test the Kernel:

1. To start the kernel, open the Terminal application and type the full pathname of the MathKernel binary in the window that appears. For example, if you installed *Mathematica* in the Applications folder, type `/Applications/Mathematica.app/Contents/MacOS/MathKernel` in a **Terminal** window and press `Return`.

```
In[1]:=
```

2. Type `N[Pi, 20]` and press `Return`. The number in the output should match the output shown here.

```
In[1]:= N[Pi, 20]
```

```
Out[1]= 3.1415926535897932385
```

```
In[2]:=
```

3. To exit the kernel, type `Exit` and press `Return`.

To Test the Front End:

1. Launch *Mathematica* by double-clicking the *Mathematica* icon.

A splash screen with initialization information appears briefly, after which an empty notebook and the **Welcome Screen** appear.

2. Type `N[Pi,20]`. Then hold down the **Shift** key and press **Enter** to evaluate. This should send the command to the kernel and return the same result as before. The `In[1]` and `Out[1]` labels are prepended once the evaluation is completed.

In the notebook window, there should be a horizontal line across the notebook; this is the horizontal insertion bar. If you do not see one, move the pointer until it becomes a horizontal I-beam and click once to see the insertion bar.

3. Press the **Esc** key. You should see three small horizontal lines in a column (`⋮`). Type `int` and press **Esc** again. You should see an integral sign (`∫`). As an additional font check, typing `\[CheckmarkedBox]` and `\[CirclePlus]` should print the symbols `☑` and `⊕`, respectively. If the symbols show up correctly, the fonts have been properly installed.
4. From the **Help** menu, choose **Documentation Center**. The *Mathematica* Documentation Center should appear.

Configuration Files on Mac OS X

Mathematica stores preference settings and initialization data in two directories, `$BaseDirectory` and `$UserBaseDirectory`. Within each of these directories are several possible subdirectories with titles such as `FrontEnd`, `Kernel`, and `Licensing`.

- Global settings that affect all users are stored in subdirectories of the directory `$BaseDirectory`. The default value of `$BaseDirectory` on Mac OS X is `/Library/Mathematica`. To redefine the location of global preference settings and initialization data, set the environment variable `MATHEMATICA_BASE`.
- Settings that only affect a particular user are stored in subdirectories of the directory `$UserBaseDirectory`, which is typically a subdirectory of the user's home directory. The default value of `$UserBaseDirectory` on Mac OS X is `~/Library/Mathematica`. To redefine the location of user preferences and initialization data, set the environment variable `MATHEMATICA_USERBASE`.

Settings in the directory `$UserBaseDirectory` override global settings defined in the directory `$BaseDirectory`.

In the pathnames that follow, replace the variables `$BaseDirectory` and `$UserBaseDirectory` with the appropriate directories for your system. To find their locations on your system, evaluate the command `$BaseDirectory` (or `$UserBaseDirectory`) in a *Mathematica* notebook.

Kernel

The initialization files used by the kernel contain *Mathematica* commands that are evaluated at startup, such as function definitions, packages to load, or kernel option settings. These commands are also available to the *Mathematica* front end.

```
$BaseDirectory/Kernel/init.m
```

This file is used to initialize the kernel and therefore should store any kernel commands that are appropriate for all users running the kernel.

```
$UserBaseDirectory/Kernel/init.m
```

This file stores user-specific commands used to initialize the kernel.

Kernel initialization files are not created automatically.

Front End

Front end initialization files store preference settings such as the values of global options in the Option Inspector. These files are automatically updated by *Mathematica* when you change a setting in the front end. To make changes to this file, make your changes from within *Mathematica* rather than editing the file directly.

```
$BaseDirectory/FrontEnd/init.m
```

This file stores systemwide defaults used by all *Mathematica* front ends. The settings in this file affect all users. "Systemwide Defaults on Mac OS X" explains how to implement changes to this global file.

```
$UserBaseDirectory/FrontEnd/init.m
```

This file defines settings within the front end that are specific to each user.

```
$UserBaseDirectory/FrontEnd/7.0 Caches/
```

This directory within the user's home directory stores information on system settings that are read by the front end.

Front end initialization files are created automatically.

Passwords

Passwords are stored in the `mathpass` file, described in further detail in "Registration and Passwords". In the following pathname, replace the variable `$InstallationDirectory` with the directory where you installed *Mathematica*. To find the value of `$InstallationDirectory` on your system, evaluate the command `$InstallationDirectory` in a *Mathematica* notebook.

```
$BaseDirectory/Licensing/mathpass
```

This is the default location for the global password file.

```
$InstallationDirectory/Configuration/Licensing/mathpass
```

This is an alternative location for the global password file.

```
$UserBaseDirectory/Licensing/mathpass
```

While this is not normally the location for the password file, a user-specific `mathpass` file can be stored here.

Systemwide Defaults on Mac OS X

If you have installed *Mathematica* in a location where multiple users run it (for example, on a file server or multi-user machine), then you can set up systemwide defaults for the *Mathematica* front end and kernel. This is ideal for setting up *Mathematica* for use in computer labs and classrooms. If you share the directory `$BaseDirectory` across the network, these defaults will also take effect on local installations that use the shared `$BaseDirectory`.

The following instructions assume that `$BaseDirectory` and `$UserBaseDirectory` have their default values, `/Library/Mathematica` and `~/Library/Mathematica`, respectively.

To Set Up a Configuration File for the Front End:

1. Launch *Mathematica*, and set up any changes to the front end that you need. For example, you may want to modify default file locations, language options, or menu settings.

2. Quit *Mathematica*.
3. Copy the file `~/Library/Mathematica/FrontEnd/init.m` to the directory `/Library/Mathematica/FrontEnd`.

These settings will now be used by the front end unless overridden by the local `init.m` file stored in the user's `~/Library/Mathematica/FrontEnd` directory.

To Set Up a Configuration File for the Kernel:

1. Launch *Mathematica*, and create a new file.
2. Add any *Mathematica* commands that should be evaluated on startup. For example, you may want to add a function definition or display a message at startup. Enter all the commands in the same cell, separating commands with semicolons.
3. Make this cell an initialization cell by selecting the cell bracket and then choosing **Cell ► Cell Properties ► Initialization Cell**.
4. When you have finished making your changes, choose **File ► Save** and select **Mathematica Package** from the **Save as type** popup menu. Then save the file as `/Library/Mathematica/Kernel/init.m`.

These commands will be evaluated when users launch *Mathematica*. If you added a function definition, that function will be available to all users.

Troubleshooting on Mac OS X

Passwords

If the front end password dialog box appears when you launch *Mathematica*, either *Mathematica* could not locate the `mathpass` file or there was no valid password in the `mathpass` file. To resolve this problem, first check that there is a `mathpass` file in one of these directories: `/Library/Mathematica/Licensing`, `$InstallationDirectory/Configuration/Licensing`, or `~/Library/Mathematica/Licensing`. To find the exact location of `$InstallationDirectory` on your machine, evaluate the command `$InstallationDirectory` in a notebook. If you did not find a `mathpass` file in these locations, follow the instructions in "Entering a Single-Machine Password" to reenter your password.

If there is a `mathpass` file in one of those directories, the password or passwords are invalid. Make sure that your MathID number matches the MathID number used to issue your password. If your MathID number changes, you will need to contact Customer Service to get a new password. Contact information is provided in "Registration and Passwords".

Front End Preferences

Front end preferences, such as the locations of recently opened and saved files, are stored in a front end initialization file called `init.m`. This file is located in the directory `~/Library/Mathematica/FrontEnd`. If you need to reset the front end preferences to their default values, hold down `Shift+Option` during startup. This will cause the initialization file to be rebuilt automatically.

Caches

Information about your *Mathematica* system layout, such as the locations of text resource files and help files, is stored in caches. These caches are located in the directory `~/Library/Mathematica/FrontEnd/7.0/Caches`.

A corrupted cache may cause the front end to produce an error or quit immediately on startup. The most convenient way to restore the caches to their default values is to hold down `Shift+Option` during startup. This will cause the *Mathematica* caches and the initialization file to be rebuilt automatically.

If you want to rebuild your caches but retain your preferences, hold down `Shift` during startup. This will delete and rebuild the cache without rebuilding your front end initialization file.

Technical Support

For further assistance, check the Technical Support FAQs on the web at support.wolfram.com. If you are a Site License Administrator, additional Site License Documentation is available at site.wolfram.com. If you do not find the information you need, please contact Technical Support by sending email to support@wolfram.com or by calling +1-217-398-6500. Include your license number in all correspondence. Your license number is located on your electronic or printed license certificate. It is also available after installation by going to the **Help** menu and clicking **About Mathematica**. You must be a registered user in order to receive installation support. You must have a current *Premier Service* subscription to receive Technical Support.

System Administration for Single-Machine Licenses

Mathematica

Windows

Installing Mathematica on Windows

Installing Mathematica for Network Licenses

Requirements

Mathematica is available for Windows, Unix, Linux, and Mac OS X. For a complete list of platform availability, visit www.wolfram.com/products/mathematica/platforms.html. Any supported machine can act as a client for running *Mathematica*, provided the following two conditions are met:

- The client has access to the *Mathematica* files, either locally or from a file server on the network.
- The license server running *MathLM* is available on the TCP/IP network.

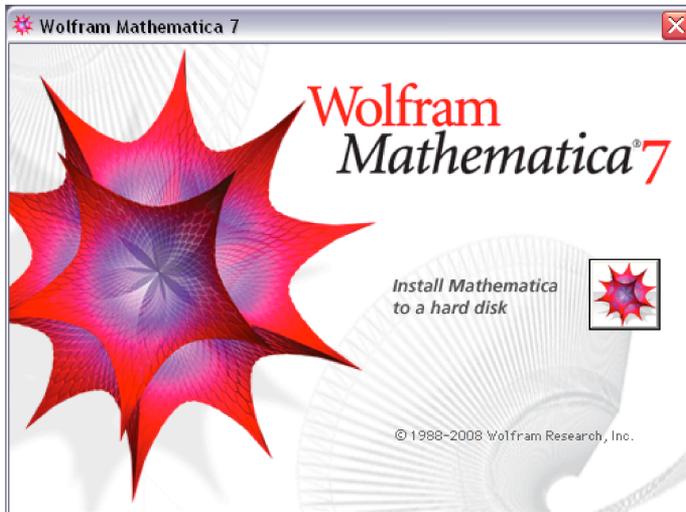
A license server can also function as its own client. However, this is not recommended. If the machine has to be rebooted for any reason, the serving of licenses to all other clients on the network may be disrupted.

Before you install *Mathematica* as a license server client, *MathLM* should already be installed and running on a license server on the network (see "Installing *MathLM*" for details). To complete the *Mathematica* installation, you will need to know the name or IP address of the license server running *MathLM*.

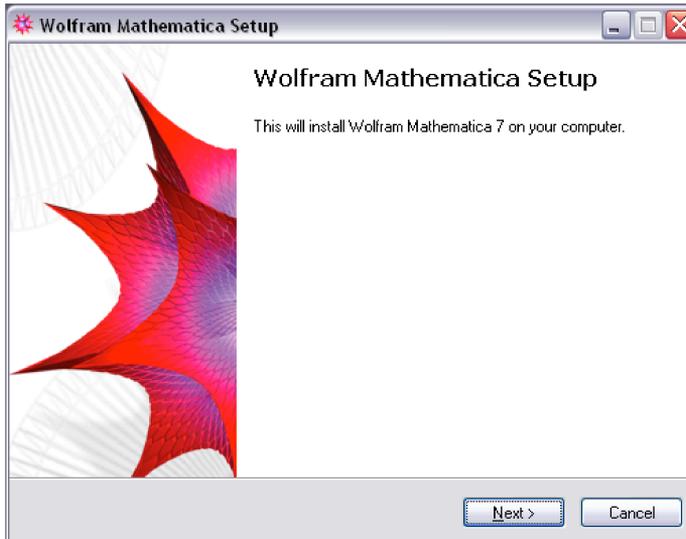
To install *Mathematica* on Windows 2000/XP/Vista, you must have administrative privileges.

To Install *Mathematica*:

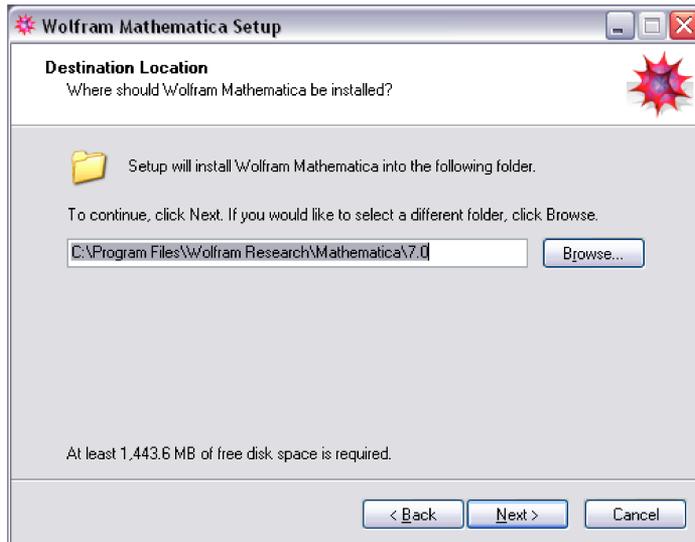
1. Insert the *Mathematica* DVD. The **Wolfram Mathematica 7** window appears on your screen. Click the button labeled **Install Mathematica to a hard disk**.



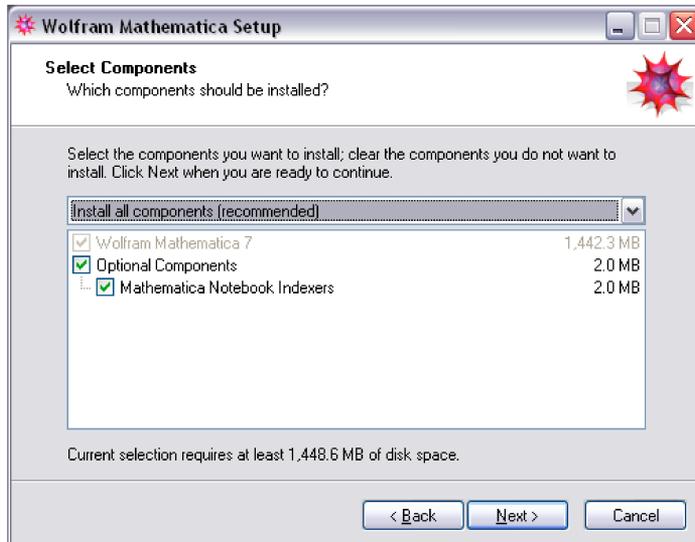
2. The **Wolfram Mathematica Setup** dialog appears on your screen. Click **Next** to begin the installation process.



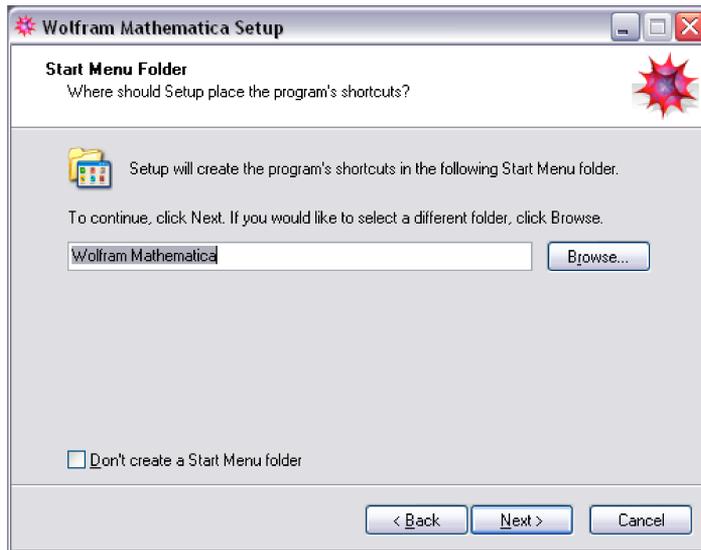
3. By default, *Mathematica* is installed in the directory C:\Program Files\Wolfram Research\Mathematica\7.0. To choose another destination directory, click **Browse**. Click **Next** to continue.



4. *Mathematica* is configured to automatically install all optional components. To choose another configuration, de-select any components by clicking on the corresponding check box. Click **Next** to continue.



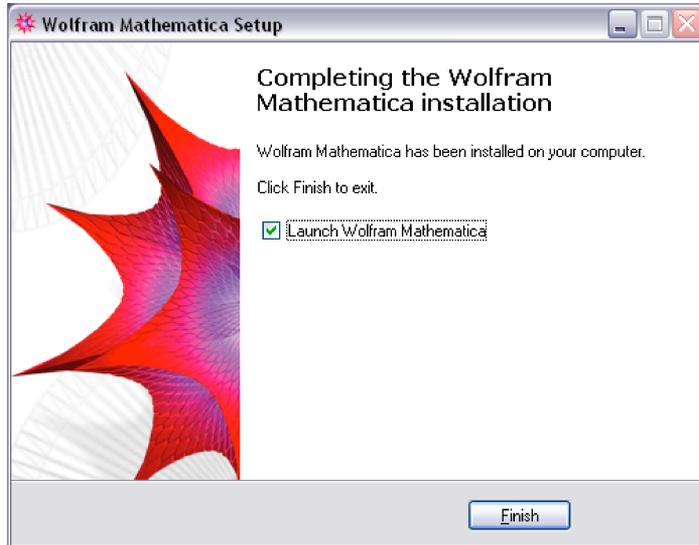
5. Click **Next** to add *Mathematica* shortcuts to the **Start** menu in the Wolfram *Mathematica* folder. If you would like to select a different folder, click **Browse**.



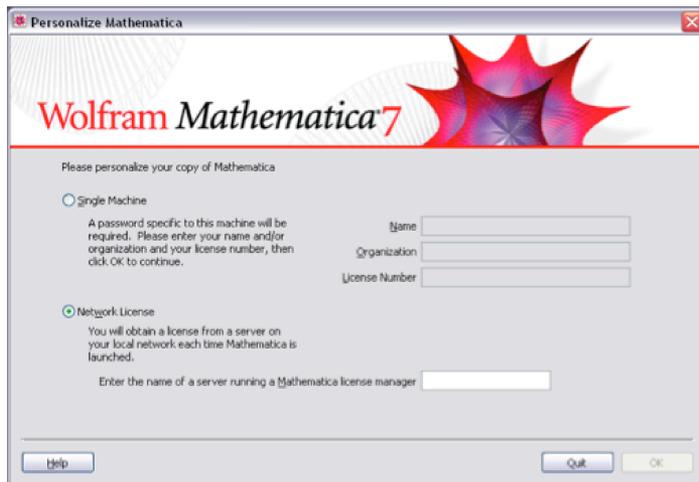
6. Click **Install** to install *Mathematica*.



7. Click **Finish** to complete the installation and launch *Mathematica*.



8. *Mathematica* starts up and the following password dialog box appears. Select **Network License**. Then enter the name or IP address of the license server running *MathLM* in the text field provided.



9. Click **OK**. You are now ready to start using *Mathematica*.

Installing Mathematica for Single-Machine Licenses

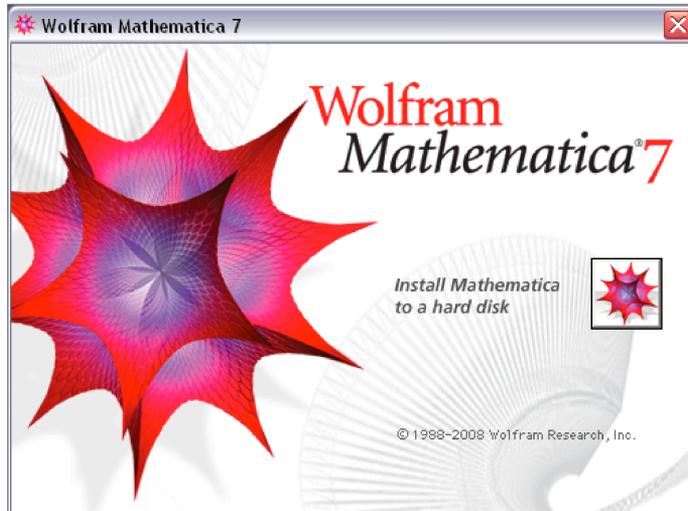
Follow these instructions to install a standalone copy of *Mathematica* that does not get a license from a license server. Depending on your license type, this may require contacting Wolfram Research to purchase additional licenses.

To run *Mathematica*, you must register with Wolfram Research and receive a password. See "Registration and Passwords" for further information.

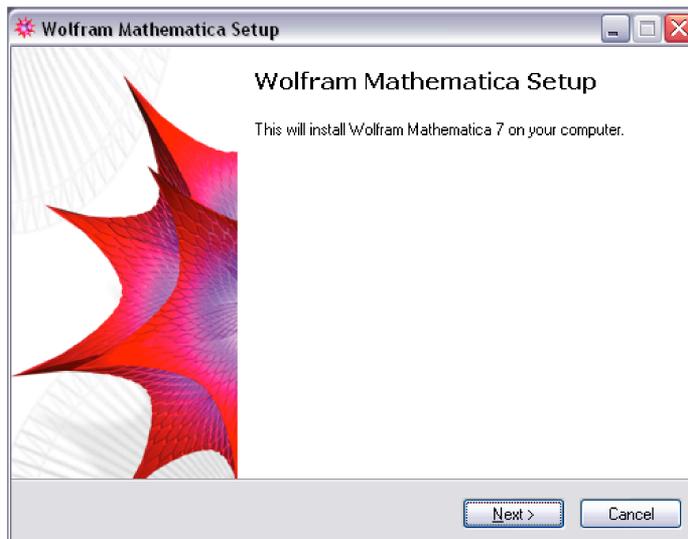
To install *Mathematica* on Windows 2000/XP/Vista, you must have administrative privileges.

To Install a Single-Machine Copy of *Mathematica* on Windows:

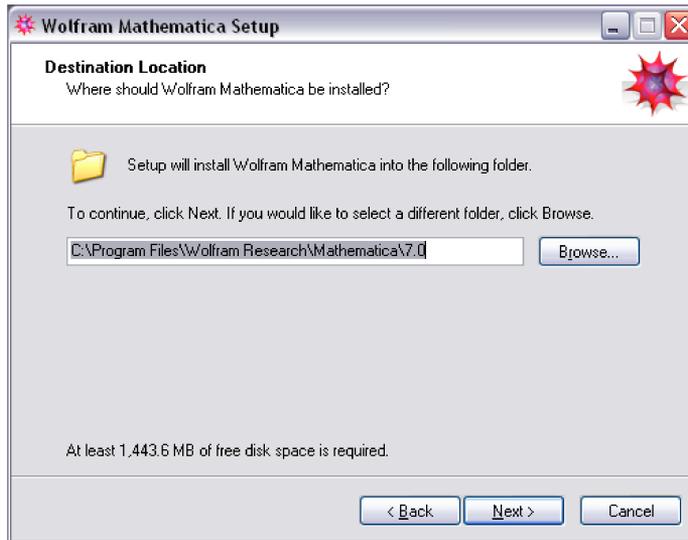
1. Insert the *Mathematica* DVD. The **Wolfram Mathematica 7** window appears on your screen. Click the button labeled **Install Mathematica to a hard disk**.



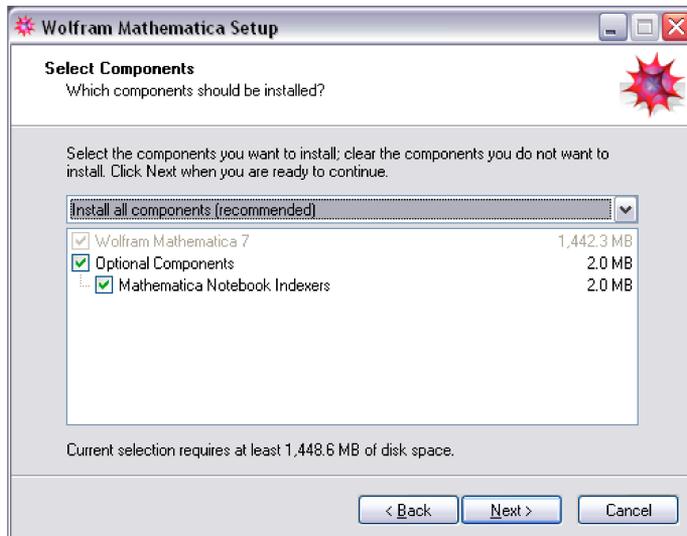
2. The **Wolfram Mathematica Setup** dialog appears on your screen. Click **Next** to begin the installation process.



3. By default, *Mathematica* is installed in the directory C:\Program Files\Wolfram Research\Mathematica\7.0. To choose another destination directory, click **Browse**. Click **Next** to continue.



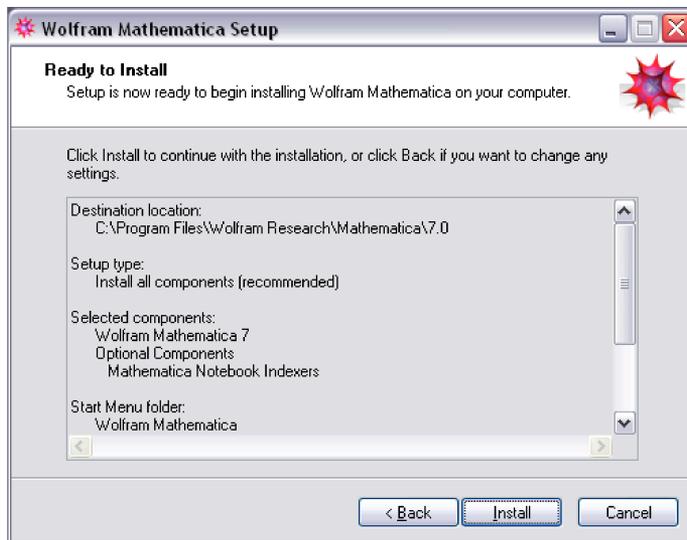
4. *Mathematica* is configured to automatically install all optional components. To choose another configuration, de-select any components by clicking on the corresponding check-box. Click **Next** to continue.



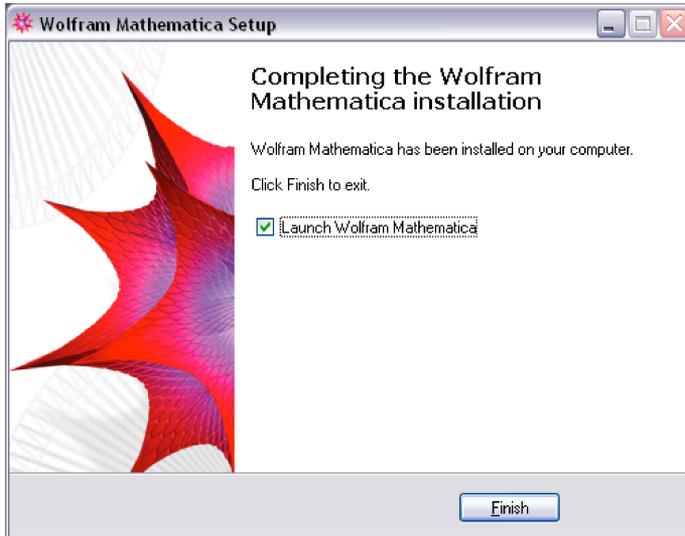
5. Click **Next** to add *Mathematica* shortcuts to the **Start** menu under *Wolfram Mathematica*.



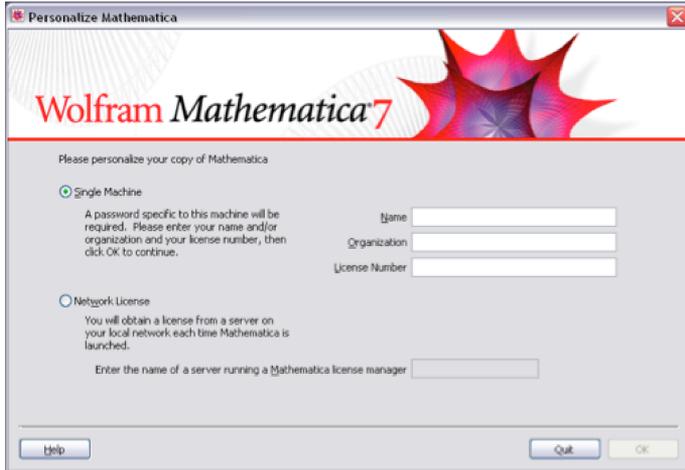
6. Click **Install** to install *Mathematica*.



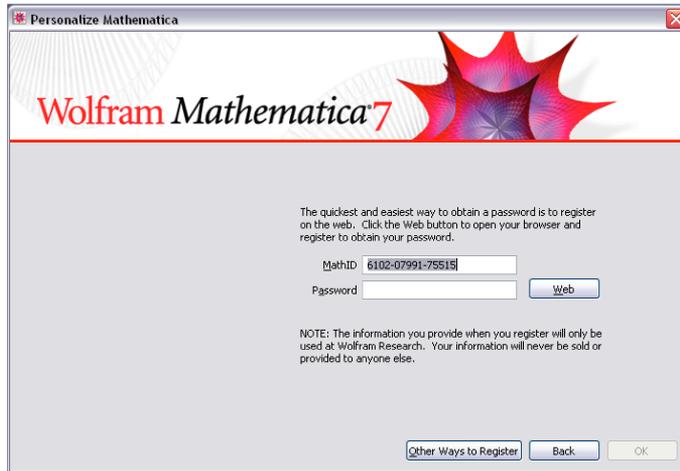
7. Click **Finish** to complete the installation and launch *Mathematica*.



8. *Mathematica* starts up and the following password dialog box appears. Select **Single Machine**. Then enter your name, the name of your organization, and your license number (located on your electronic or printed license certificate) in the text fields provided. Click **OK** when you are done.



- The following dialog box appears showing the MathID number for your machine. To obtain your password, click the **Web** button, go to register.wolfram.com, or contact Wolfram Research (see "Registration and Passwords" for further information). You will need to supply your license number and your MathID number.



- Enter your password and click **OK**. You are now ready to start using *Mathematica*.

Installing Mathematica from a File Server

One convenient way to install *Mathematica* is to run the installer remotely from a file server. This is an efficient way of making *Mathematica* available to a large number of users without having to supply a DVD to each one.

Installing *Mathematica* from a file server requires first copying the installer executable and all files in the *Mathematica* distribution from the DVD onto the file server.

- Insert the *Mathematica* DVD into the drive on the file server. Open a **My Computer** window, then right-click the DVD in the list and select **Open**.
- An Explorer window appears showing the contents of the DVD. Select the Windows folder.
- Copy the Windows folder from the DVD to a location on the file server accessible to external users over the network.

Once this step is complete, you can install the *Mathematica* files on each client.

- From the client, connect to the file server and open the Windows directory that was created on the file server.
- Double-click the file Setup.exe to launch the installer.
- Follow the same steps as for installing from a DVD (see "Network License" and "Single-Machine License").

Installing Mathematica from a Script

If you are installing *Mathematica* on multiple machines, it can be time-consuming to respond to all of the installer prompts on each individual machine. By supplying command-line options to the installer, you can customize various features of the installation process or automate it entirely.

<code>/dir="C:\path\here"</code>	specify the installation directory
<code>DisableShellVerbs</code>	disable file associations for .m, .nb, .nbp, etc. (enabled by default)
<code>/group="start menu folder name"</code>	specify the start menu folder name
<code>/noicons</code>	disable creation of start menu folder and shortcuts
<code>/norestart</code>	do not restart the system, even if necessary
<code>/restartexitcode=code</code>	specify the installer exit code to return if restart is necessary
<code>/silent</code>	force an automatic installation and suppress installation windows
<code>/suppressmsgboxes</code>	suppress installer message boxes (only effective when used in conjunction with <code>/silent</code>)

Mathematica Installer supported command-line options.

To Create a Script That Performs a Silent *Mathematica* Installation:

The following instructions explain how to write a simple script to silently install *Mathematica* from a file server. These instructions require that you have a mathpass file with a valid password. See "Registrations and Passwords" for more information on sitewide mathpass configurations.

1. Follow the instructions in the first part of "Installing *Mathematica* from a File Server" to copy the installer and files from the DVD to a file server.
2. Copy your mathpass file to the same directory on the file server as the installer and *Mathematica* files.
3. Open Notepad (**Start Menu** ► **Programs** ► **Accessories** ► **Notepad**) and type the following lines into a new file.

```
@echo off
echo Installing Mathematica...
\\server\math\setup.exe /silent /suppressmsgboxes /log="C:\Windows\Temp\install.log"
echo Creating password file...
copy \\server\math\mathpass "C:\Directory\Name"
echo Mathematica installation complete.
```

Change all instances of `\\server\math` to the pathname of the network share where the *Mathematica* installation files and `mathpass` file were copied.

5. Change "C:\Directory\Name" to the directory listed here for your version of Windows. Be sure to enclose the name of the directory in quotes.

Windows 2000/XP—

"C:\Documents and Settings\All Users\Application Data\Mathematica"

Windows Vista—"C:\ProgramData\Mathematica"

Note: These directories are the values of `$BaseDirectory` for different versions of Windows. See "Configuration Files on Windows" for further information.

6. To save the file, choose **File ► Save**. Save the file in the same directory as the *Mathematica* installation files. Type the filename `install.bat`, and choose **All Files** from the **Save as type** popup menu. Click **Save**, then quit Notepad.

To Perform a Silent *Mathematica* Installation:

1. On the client, open a **Command Prompt** window, type the pathname of the `install.bat` file, and press Enter. For example, if the network share is called `\\server\math`, type:

```
\\server\math\install.bat
```

The following messages are displayed.

```
Installing Mathematica...
Creating password file...
Mathematica installation complete.
```

2. The installation is now complete. If you see any messages other than those printed here, check the file `C:\Windows\Temp\install.log` on the client machine for further information.

Installing *Mathematica* in this way eliminates the need to take the DVD to each client machine, and saves time by allowing you to run a simple script instead of responding to the installer questions.

Launching Mathematica on Windows

Launching Mathematica Locally

To run *Mathematica* using a network license, both the client machine and the license server must be on the network, and *MathLM* must be running.

To Launch *Mathematica*:

From the **Start** menu, choose **Programs ► Wolfram Mathematica ► Mathematica 7**.

Alternatively, you can open an Explorer window, go to the Program Files\Wolfram Research\Mathematica\7.0 directory, and double-click the *Mathematica* icon.

To Launch Only the *Mathematica* Kernel:

From the **Start** menu, choose **Programs ► Wolfram Mathematica ► Mathematica 7 Kernel**.

Alternatively, you can open an Explorer window, go to the Program Files\Wolfram Research\Mathematica\7.0 directory, and double-click the **MathKernel** icon.

To Launch the *Mathematica* Kernel inside a Command Prompt Window:

Open a command prompt window and change directory to the top-level *Mathematica* installation directory. Type `.\math` and press **Enter**.

Launching Mathematica from a File Server

You can also run *Mathematica* directly from a file server, without installing files locally. To do this, install *Mathematica* on the file server and make the installation directory accessible to the client machines. Running *Mathematica* from a file server differs from running a local copy in several ways. These differences and appropriate steps for working around them are listed here.

- The *Mathematica* fonts will not be available for use by other applications. It is therefore required that you manually install the fonts on your system. The fonts are found in SystemFiles\Fonts\Windows in the *Mathematica* layout. To install these fonts so they can be used by all other Windows applications, open the Fonts control panel, choose **Install New Font** under the **File** menu, and specify the location of the fonts in the **Add Fonts** dialog box that appears.
- The *MathLink* libraries will not be available for use by other applications. Therefore, you need to copy the *MathLink* libraries to the appropriate locations on your system. For 32-bit Windows systems, the *MathLink* libraries consist of seven files: ml32i1.dll, ml32i2.dll, ml32i3.dll, mlmap32.mlp, mlshm32.mlp, mltcp32.mlp, and mltcpip32.mlp, which are located in SystemFiles\Links\MathLink\DeveloperKit\Windows\SystemAdditions in the *Mathematica* layout. Copy these files to the WINNT\System32 folder on Windows 2000, or the Windows\System32 folder on Windows XP/Vista. For 64-bit Windows platforms, the *MathLink* libraries consist of twelve files: ml32i1.dll, ml32i2.dll, ml32i3.dll, mlmap32.mlp, mlshm32.mlp, mltcp32.mlp, and mltcpip32.mlp, which are located in

SystemFiles\Links\MathLink\DeveloperKit\Windows\SystemAdditions, and ml64i2.dll, ml64i3.dll, mlsh64.mlp, mltcp64.mlp, mltcpip64.mlp, which are located in SystemFiles\Links\MathLink\DeveloperKit\Windows-x86-64\SystemAdditions. Copy the first seven files to the Windows\Syswow64 folder and the other five files to the Windows\System32 folder.

- The proper file associations will not be set up for *Mathematica*. You can set these associations manually by using the **Folder Options** dialog box under the **Tools** menu of the Explorer window. You will need to specify the MIME type as application/mathematica and the file extension as .nb.
- A **Start** menu entry for *Mathematica* will not be created automatically. You can add this manually by editing the **Start** menu settings in the dialog box that appears when you choose **Settings** ► **Taskbar and Start Menu** under the **Start** menu.

Mathematica Command-Line Options

Following are several useful command-line options for the *Mathematica* kernel. See "Launching *Mathematica* on Windows: Locally" for instructions on running the kernel.

Command-Line Options

<code>-lmverbose</code>	print diagnostic information to <code>stderr</code>
<code>-mathlink</code>	specify that the kernel should be run in <i>MathLink</i> mode
<code>-noprompt</code>	specify that no banner or In/Out prompts should be printed
<code>-password <i>str</i></code>	specify a password to use instead of the password or passwords stored in the <code>mathpass</code> file
<code>-pwfile <i>file</i></code>	specify the name of a file that has a valid password
<code>-run</code>	specify a command to be run on startup as an argument

Mathematica command-line options.

The option `-lmverbose` is useful for debugging problems related to the license server.

The option `-mathlink` can also be used as a command-line option for the *Mathematica* front end. See www.wolfram.com/solutions/mathlink for additional information about *MathLink*.

The mode set by `-noprompt` is useful for running a sequence of commands from a batch file.

The string for `-password` should have the form "`!servername`" or "`machinename mathid licensenumber password`".

Testing the Installation on Windows

The following simple commands allow you to test the installation of *Mathematica*. Running these commands does not guarantee that the installation was successful, but a failed command can indicate that a serious problem occurred during installation.

You should run these tests from a regular user account and not from an account with administrative privileges.

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

If you run into problems when doing these tests, see the troubleshooting tips in "Troubleshooting on Windows". If you do not find the answer there, check the Technical Support website at support.wolfram.com/mathematica.

To Test the Kernel:

1. To start the kernel, choose **Programs ► Wolfram Mathematica ► Mathematica 7 Kernel** from the **Start** menu.

```
In[1]:=
```

2. Type `N[Pi, 20]` and press **Enter**. The number in the output should match the output shown here.

```
In[1]:= N[Pi, 20]
```

```
Out[1]= 3.1415926535897932385
```

```
In[2]:=
```

3. To exit the kernel, type `Exit` and press **Enter**.

To Test the Front End:

1. Launch *Mathematica* by choosing **Programs ► Wolfram Mathematica ► Mathematica 7** from the **Start** menu.

A splash screen with initialization information appears briefly, after which an empty notebook and the **Welcome Screen** appear.

2. Type `N[Pi,20]`. Then hold down the **Shift** key and press **Enter** to evaluate. This should send the command to the kernel and return the same result as before. The `In[1]` and `Out[1]` labels are prepended once the evaluation is completed.

In the notebook window, there should be a horizontal line across the notebook; this is the horizontal insertion bar. If you do not see one, move the pointer until it becomes a horizontal I-beam and click once to see the insertion bar.

3. Press the `Esc` key. You should see three small horizontal lines in a column (ε). Type `int` and press `Esc` again. You should see an integral sign (\int). As an additional font check, typing `\[CheckmarkedBox]` and `\[CirclePlus]` should print the symbols \boxtimes and \oplus , respectively. If the symbols show up correctly, the fonts have been properly installed.
4. From the **Help** menu, choose **Documentation Center**. The *Mathematica* Documentation Center should appear.

Configuration Files on Windows

Mathematica stores preference settings and initialization data in two directories, `$BaseDirectory` and `$UserBaseDirectory`. Within each of these directories are several possible subdirectories with titles such as `FrontEnd`, `Kernel`, and `Licensing`.

Global settings that affect all users are stored in subdirectories of the directory `$BaseDirectory`. The default value of `$BaseDirectory` for different versions of Windows is shown in the following table. To redefine the location of global preference settings and initialization data, set the environment variable `MATHEMATICA_BASE`.

Windows 2000/XP	C:\Documents and Settings\All Users\Application Data\Mathematica
Windows Vista	C:\ProgramData\Mathematica

Location of the directory `$BaseDirectory` for different versions of Windows.

Settings that only affect a particular user are stored in subdirectories of the directory `$UserBaseDirectory`. The default value of `$UserBaseDirectory` for different versions of Windows is shown in the following table. To redefine the location of user preferences and initialization data, set the environment variable `MATHEMATICA_USERBASE`.

Windows 2000/XP	C:\Documents and Settings\ <i>username</i> \Application Data\Mathematica
Windows Vista	C:\Users\ <i>username</i> \AppData\Roaming\Mathematica

Location of the directory `$UserBaseDirectory` for different versions of Windows.

Settings in the directory `$UserBaseDirectory` override global settings defined in the directory `$BaseDirectory`.

In the pathnames that follow, replace the variables `$BaseDirectory` and `$UserBaseDirectory` with the appropriate directories for your system. To find their locations on your system, evaluate the command `$BaseDirectory` (or `$UserBaseDirectory`) in a *Mathematica* notebook.

Kernel

The initialization files used by the kernel contain *Mathematica* commands that are evaluated at startup, such as function definitions, packages to load, and kernel option settings. These commands are also available to the *Mathematica* front end.

```
$BaseDirectory\Kernel\init.m
```

This file is used to initialize the kernel and therefore should store any kernel commands that are appropriate for all users running the kernel.

```
$UserBaseDirectory\Kernel\init.m
```

This file stores user-specific commands used to initialize the kernel.

Kernel initialization files are not created automatically.

Front End

Front end initialization files store preference settings such as the values of global options in the Option Inspector. These files are automatically updated by *Mathematica* when you change a setting in the front end. To make changes to this file, make your changes from within *Mathematica* rather than editing the file directly.

```
$BaseDirectory\FrontEnd\init.m
```

This file stores systemwide defaults used by all *Mathematica* front ends. The settings in this file affect all users. "Systemwide Defaults on Windows" explains how to implement changes to this global file.

```
$UserBaseDirectory\FrontEnd\init.m
```

This file defines settings within the front end that are specific to each user.

Front end initialization files are created automatically.

Front End Caches

The front end stores certain information about system settings in caches specific to each user. The default location for front end caches is shown here.

Windows 2000/XP	C:\Documents and Settings\ <i>username</i> \Local Settings\ Application Data\Mathematica\FrontEnd\7.0 Caches
Windows Vista	C:\Users\ <i>username</i> \AppData\Local\Mathematica\FrontEnd\7.0 Caches

Location of the front end caches for different versions of Windows.

Passwords

Passwords are stored in the `mathpass` file, described in further detail in "Registration and Passwords". In the following pathname, replace the variable `$InstallationDirectory` with the directory where you installed *Mathematica*. The default value of `$InstallationDirectory` on Windows is `C:\Program Files\Wolfram Research\Mathematica\7.0`. To find the value of `$InstallationDirectory` on your system, evaluate the command `$InstallationDirectory` in a *Mathematica* notebook.

```
$BaseDirectory\Licensing\mathpass
```

This is the default location for the global password file.

```
$InstallationDirectory\Configuration\Licensing\mathpass
```

This is an alternative location for the global password file.

```
$UserBaseDirectory\Licensing\mathpass
```

While this is not normally the location for the password file, a user-specific `mathpass` file can be stored here.

Systemwide Defaults on Windows

If you have installed *Mathematica* in a location where multiple users can run it (for example, on a file server or multi-user machine), then you can set up systemwide defaults for the *Mathematica* front end and kernel. This is ideal for setting up *Mathematica* for use in computer labs and classrooms. If you share the directory `$BaseDirectory` across the network, these defaults will also take effect on local installations that use the shared `$BaseDirectory`.

In the pathnames that follow, replace the variables `$BaseDirectory` and `$UserBaseDirectory` with the appropriate directories for your system. To find their locations on your system, evaluate the command `$BaseDirectory` (or `$UserBaseDirectory`) in a *Mathematica* notebook.

To Set Up a Configuration File for the Front End:

1. Launch *Mathematica*, and set up any changes to the front end that you need. For example, you may want to modify default file locations, language options, or menu settings.
2. Quit *Mathematica*.
3. Copy the file `$UserBaseDirectory\FrontEnd\init.m` to the directory `$BaseDirectory\FrontEnd`.

These settings will now be used by the front end unless overridden by the local `init.m` file stored in the user's `$UserBaseDirectory\FrontEnd` directory.

To Set Up a Configuration File for the Kernel:

1. Launch *Mathematica*, and create a new file.
2. Add any *Mathematica* commands that should be evaluated on startup. For example, you may want to add a function definition or display a message at startup. Enter all the commands in the same cell, separating commands with semicolons.
3. Make this cell an initialization cell by selecting the cell bracket and then choosing **Cell ► Cell Properties ► Initialization Cell**.
4. When you have finished making your changes, choose **File ► Save** and select **Mathematica Package** from the **Save as type** popup menu. Then save the file as `$BaseDirectory\Kernel\init.m`.

These commands will be evaluated when users launch *Mathematica*. If you added a function definition, that function will be available to all users.

If you have created systemwide defaults you want to carry over to new local installations, you can add lines to an installation script to copy preconfigured `init.m` files as part of a new installation. For information about installation scripts, see "Installing *Mathematica* on Windows". To copy systemwide defaults, add a line to the script similar to the line that copies the `mathpass` file.

Troubleshooting on Windows

Passwords

If the front end password dialog box appears when you launch *Mathematica*, either *Mathematica* could not locate the `mathpass` file or there was no valid password in the `mathpass` file.

To resolve this problem, first check that there is a `mathpass` file in one of these directories: `$BaseDirectory\Licensing`, `$InstallationDirectory\Configuration\Licensing`, or `$UserBaseDirectory\Licensing`. To find the exact location of these directories on your machine, evaluate the command `$BaseDirectory` (or `$InstallationDirectory` or `$UserBaseDirectory`) in a notebook. If you did not find a `mathpass` file in these locations, follow the instructions in "Entering a Single-Machine Password" to reenter your password.

If there is a `mathpass` file in one of those directories, the password or passwords are invalid. Make sure that your MathID number matches the MathID number used to issue your password. If your MathID number changes, you will need to contact Customer Service to get a new password. Contact information is provided in "Registration and Passwords".

Front End Preferences

Front end preferences, such as the locations of recently opened and saved files, are stored in a front end initialization file called `init.m`. This file is located in `$UserBaseDirectory\FrontEnd`. The default value of `$UserBaseDirectory` for different versions of Windows is listed in "Configuration Files on Windows". To find the exact location of this directory on your machine, evaluate the command `$UserBaseDirectory` in a notebook.

If you need to reset the front end preferences to their default values, hold down **Shift+Ctrl** during startup. This will cause the initialization file to be rebuilt automatically.

Caches

Information about your *Mathematica* system layout, such as the locations of text resource files, is stored in caches. These caches are located in `C:\Documents and Settings\username\Local Settings\Application Data\Mathematica\FrontEnd\7.0 Caches\` on Windows 2000/XP and in `C:\Users\username\AppData\Local\Mathematica\FrontEnd\7.0 Caches\` on Vista.

A corrupted cache may cause the front end to produce an error or quit immediately on startup. The most convenient way to restore the caches to their default values is to hold down **Shift+Ctrl** during startup. This will cause the *Mathematica* caches and the initialization file to be rebuilt automatically. If you want to rebuild your caches but retain your preferences, hold down **Shift** during startup. This will delete and rebuild the cache without rebuilding your front end initialization file.

Technical Support

For further assistance, check the Technical Support FAQs on the web at support.wolfram.com. If you are a Site License Administrator, additional Site License Documentation is available at site.wolfram.com. If you do not find the information you need, please contact Technical Support by sending email to support@wolfram.com or by calling +1-217-398-6500. Include your license number in all correspondence. Your license number is located on your electronic or physical copy of the license certificate. It is also available after installation by going to the **Help** menu and clicking **About Mathematica**. You must be a registered user in order to receive installation support. You must have a current *Premier Service* subscription to receive Technical Support.

Unix and Linux

Installing Mathematica on Unix and Linux

Installing Mathematica for Network Licenses

Requirements

Mathematica is available for Windows, Unix, Linux, and Mac OS X. For a complete list of platform availability, visit www.wolfram.com/products/mathematica/platforms.html. Any supported machine can act as a client for running *Mathematica*, provided the following two conditions are met:

- The client has access to the *Mathematica* files, either locally or from a file server on the network.
- The license server running *MathLM* is available on the TCP/IP network.

A license server can also function as its own client. However, this is not recommended. If the machine has to be rebooted for any reason, the serving of licenses to all other clients on the network may be disrupted.

Before you install *Mathematica* as a license server client, *MathLM* should already be installed and running on a license server on the network (see "Installing *MathLM* on Windows", and "Installing *MathLM* on Unix, Linux, and Mac OS X" for details). To complete the *Mathematica* installation, you will need to know the name or IP address of the license server running *MathLM*.

To install *Mathematica* on Unix and Linux, you may need `root` privileges.

To Install *Mathematica*:

1. Mount the CD or DVD. For information on mounting a CD/DVD, see "Mounting a CD or DVD on Unix and Linux".

Note: This step may not be required on some Linux and Unix platforms, as some operating systems automatically handle mounting.

2. Change directory to `/cdrom/Unix/Installer`. Note that the exact location of the CD/DVD mount point might be different for your platform.

```
cd /cdrom/Unix/Installer
```

3. Run the installer.

```
./MathInstaller
```

```
-----
                        Wolfram Mathematica 7 Installer
-----
```

```
Copyright (c) 1988-2008 Wolfram Research, Inc. All rights reserved.
```

```
WARNING: Wolfram Mathematica is protected by copyright law and
international treaties. Unauthorized reproduction or distribution may
result in severe civil and criminal penalties and will be prosecuted to
the maximum extent possible under law.
```

4. (Unix only) You are asked to select the platforms for which you are doing the installation. Select one or more of the available options and press `Enter` to continue.

```
For which of the following platforms would you like to install
Mathematica?
```

```
Type your selection (multiple choices can be separated with spaces), or
press
```

```
ENTER to select (1):
```

5. The installer prompts you to specify the directory in which *Mathematica* should be installed. The default location is `/usr/local/Wolfram/Mathematica/7.0`. Press `Enter` to accept the default, or type in a new location and then press `Enter`.

```
Enter the installation directory, or press ENTER to select
/usr/local/Wolfram/Mathematica/7.0:
```

Note: If you specify a directory that does not exist, the installer will give you the option of creating the directory. If a copy of *Mathematica* already exists in the directory you specify, the installer will inform you before overwriting the files.

Note: If you are installing over a previous version of *Mathematica*, your existing math-pass file and custom settings will **not** be deleted.

6. Once you have answered all the questions, the installer begins copying files from the CD/DVD to the directory you specified. The progress is indicated by a progress bar on the screen.

Now installing...

```
[*****]
```

7. You are asked for the location in which to copy the executable scripts. You should choose a directory that is present on each user's PATH. The scripts are also installed in the Executables subdirectory of the *Mathematica* installation directory. Type a location or accept the default and press `Enter`.

Type the directory path in which the Mathematica scripts will be created, or press `ENTER` to select `/usr/local/bin`:

Note: The installer checks to see if any other *Mathematica* scripts exist in the specified directory. If they do, you are given the chance to rename the scripts.

8. You are given several options for configuring the password. Type `2` and press `Enter` to run *Mathematica* using a network license.

Please choose how you want to configure the password for Mathematica 7.0.

(1) Single machine

Install a password specific to this machine. Mathematica will launch and you can enter your password.

(2) Network license

Obtain a license from a MathLM license server on your network each time Mathematica is launched.

(3) Enter license information later

Input your password and register when you start Mathematica.

Type your selection, or press `ENTER` to select (1):2

9. Type the hostname of the server running *MathLM*, as given by the `hostname` command. In some cases, this includes the domain name. Or, enter the IP address of the *MathLM* server. Press `Enter` to continue.

Enter the hostname of the machine on which your MathLM license manager is running:

Note: The installer does not attempt to verify the server name you type. If you prefer, you may type any arbitrary text here and press Enter. This creates the `mathpass` file with an invalid password entry. You may then edit the `mathpass` file manually to add a correct password later. More information on the `mathpass` file is given in "Registration and Passwords".

10. The installer creates the `mathpass` file and displays its location. The installation is now complete.

```
Configuring Network Password...
```

```
Adding password file entry to /usr/share/Mathematica/Licensing/mathpass...
```

```
Installation complete.
```

The installer also adds an additional menu folder named **Wolfram** to the desktop menu. Inside the folder is an item named **Mathematica** that points to the most recently installed version of *Mathematica*. File associations are also modified such that `.nb` files are now associated with the most recently installed version of *Mathematica*.

Installing Mathematica for Single-Machine Licenses

Follow these instructions to install a standalone copy of *Mathematica* that does not get a license from the license server. Depending on your license type, this may require contacting Wolfram Research to purchase additional licenses.

To run *Mathematica*, you must register with Wolfram Research and receive a password. See "Registration and Passwords" for further information.

To install *Mathematica* on Unix and Linux, you may need root privileges.

To Install a Single-Machine Copy of *Mathematica* on Unix and Linux:

1. Mount the CD or DVD. For information on mounting a CD/DVD, see "Mounting a CD or DVD on Unix and Linux".

Note: This step may not be required on some Linux and Unix platforms, as some operating systems automatically handle mounting.

2. Change directory to `/cdrom/Unix/Installer`. Note that the exact location of the CD/DVD mount point might be different for your platform.

```
cd /cdrom/Unix/Installer
```

3. Run the installer.

```
./MathInstaller
```

```
-----
                Wolfram Mathematica 7 Installer
-----
```

```
Copyright (c) 1988–2008 Wolfram Research, Inc. All rights reserved.
```

```
WARNING: Wolfram Mathematica is protected by copyright law and
international treaties. Unauthorized reproduction or distribution may
result in severe civil and criminal penalties and will be prosecuted to
the maximum extent possible under law.
```

4. (Unix only) You are asked to select the platform for which you are doing the installation. Select one of the available options and press `Enter` to continue.

```
For which of the following platforms would you like to install
Mathematica?
```

```
Type your selection (multiple choices can be separated with spaces), or
press
```

```
ENTER to select (1):
```

5. The installer prompts you to specify the directory in which *Mathematica* should be installed. The default location is `/usr/local/Wolfram/Mathematica/7.0`. Press `Enter` to accept the default, or type in a new location and then press `Enter`.

```
Enter the installation directory, or press ENTER to select
/usr/local/Wolfram/Mathematica/7.0:
```

Note: If you specify a directory that does not exist, the installer will give you the option of creating the directory. If a copy of *Mathematica* already exists in the directory you specify, the installer will inform you before overwriting the files.

Note: If you are installing over a previous version of *Mathematica*, your existing math-pass file and custom settings will **not** be deleted.

6. Once you have answered all the questions, the installer begins copying files from the CD/DVD to the directory you specified. The progress is indicated by a progress bar on the screen.

```
Now installing...
```

```
[*****
```

```
]
```

7. You are asked for the location in which to copy the executable scripts. You should choose a directory that is present on each user's PATH. The scripts are also installed in the Executables subdirectory of the *Mathematica* installation directory. Type a location or accept the default and press Enter.

Type the directory path in which the Mathematica scripts will be created, or press ENTER to select /usr/local/bin:

Note: The installer checks to see if any other *Mathematica* scripts exist in the specified directory. If they do, you are given the chance to rename the scripts.

8. You are given several options for configuring the password. Type 1 and press Enter to run *Mathematica* using a single-machine license.

Please choose how you want to configure the password for Mathematica 7.0.

(1) Single machine

Install a password specific to this machine. Mathematica will launch and you can enter your password.

(2) Network license

Obtain a license from a MathLM License Server on your network each time Mathematica is launched.

(3) Enter license information later

Input your password and register when you start Mathematica.

Type your selection, or press ENTER to select (1):1

9. Your machine name and MathID number are displayed. To obtain your password, contact Wolfram Research (see "Registration and Passwords" for details). You will need to supply your MathID number and the license number located on your electronic or physical copy of the license certificate.

Configuring Single-Machine Password...

Mathematica 7.0 for *operating system*

Copyright 1988-2008 Wolfram Research, Inc.

You will need to get a password from your license certificate or from Wolfram Research (register.wolfram.com).

Machine name: hostname

MathID: xxxx-xxxxx-xxxxx

You will need a valid license ID and password in order to proceed. Go to <http://register.wolfram.com> or <http://reference.wolfram.com/singlemachine> for more information.

10. Enter your name, the name of your organization, your license number (located on your electronic or physical copy of the license certificate), and your password, and press **Enter** when you are done.

Enter your name:

Enter the name of your organization:

Enter your license ID [format Lxxxx-xxxx]:

Enter your password:

11. The installer creates the `mathpass` file and displays its location. The installation is now complete.

```
Creating password file entry in
/usr/share/Mathematica/Licensing/mathpass.
```

See <http://reference.wolfram.com/password> if *Mathematica* is installed on multiple machines and you need to set up a single, sitewide password file.

The installer also adds an additional menu folder named **Wolfram** to the desktop menu. Inside the folder is an item named **Mathematica** that points to the most recently installed version of *Mathematica*. File associations are also modified such that `.nb` files are now associated with the most recently installed version of *Mathematica*.

Installing Mathematica from a File Server

One convenient way to install *Mathematica* on a client is to run the installer remotely from a file server. This is an efficient way of making *Mathematica* available to a large number of users without having to supply a CD/DVD to each one. You can install *Mathematica* from a file server on a client running any supported Unix or Linux platform. It is not necessary that the client platform be the same as the file server platform.

To install *Mathematica* from a file server, you first must make the installer and *Mathematica* files available to the clients. You can do this by copying the contents of the CD/DVD to the file server and exporting the directory, or by exporting the CD/DVD mount point on the file server. Then, mount the directory with the *Mathematica* distribution on the client and change to this directory, and run `MathInstaller` to install *Mathematica* on the client machines. (Note that you must run `MathInstaller` from the directory in which it is located.) If you are installing *Mathematica* in a mixed-platform environment, you may need to use the `MathInstaller` option `-platform` to ensure that the correct files for your platform are installed.

Installing Mathematica from a Script

If you are installing *Mathematica* on multiple machines, it can be time-consuming to respond to all of the installer prompts on each individual machine. By supplying command-line options to the `MathInstaller` command, you can customize various features of the installation process or automate it entirely.

<code>-auto</code>	force the installation to proceed automatically without prompting the user for any information
<code>-createdir=value</code>	specify whether or not to create the directories specified by the options <code>-targetdir</code> and <code>-execdir</code>
<code>-execdir=dir</code>	specify the path to be used for the symbolic links to the executable scripts
<code>-help</code>	display information about the installer options
<code>-method=type</code>	define the type of installation you would like to perform
<code>-overwrite=value</code>	specify whether the installer should overwrite any files that already exist in the target directory
<code>-platforms=value</code>	specify the system ID of the Unix platform or platforms (e.g., Linux, Solaris, and so forth) for which you want to do the installation
<code>-selinux=value</code>	specify whether the installer should attempt to modify the security context of any included libraries so that it will function properly
<code>-silent</code>	force an automatic installation (equivalent to the <code>-auto</code> option)
<code>-targetdir=dir</code>	specify the installation directory
<code>-verbose</code>	display detailed information about the files and directories being installed

`MathInstaller` command-line options.

Note: Default values are used for any options that are not specified explicitly on the command line.

Valid input for `-createdir` is `y` for yes or `n` for no. By default, this value is set to `y`.

The default directory for `-execdir` is `/usr/local/bin`. This option only works with an automatic installation.

The values for `-method` may vary by product. When this option is applicable, the values can be determined by running the installer. The default value for this option is `Full`.

Valid input for `-overwrite` is `y` for yes or `n` for no. By default, this value is set to `y`. This option only works with an automatic installation.

The default for `-platforms` is the system you are installing on, if that information is available to the installer. This option only works with an automatic installation.

Valid input for `-selinux` is `y` for yes or `n` for no. By default, this value is set to `n`.

The option `-silent` suppresses any output from being displayed on the screen. The output is instead written to a file named `InstallerLog-number`. If the installation is unsuccessful, the log file is saved in the `/tmp` directory. Otherwise, the file is moved to the target directory and renamed `InstallerLog`.

The directory specified for `-targetdir` corresponds to the value of the global variable `$InstallationDirectory`. The default value is `/usr/local/Wolfram/Mathematica/7.0`. This option only works with an automatic installation.

To complete the installation in one step, run a command like the following.

```
./MathInstaller -auto -targetdir=/home/mathematica
```

This allows you to complete the installation automatically in one step, while still being able to customize various details such as the directory to install to. You are not prompted to enter your password using this method, so you will need to enter a password the first time *Mathematica* is launched.

If you are doing many installations, you might find it convenient to include the `MathInstaller` command with all the relevant options in a shell script. Running the shell script is then an easy way to do an identical customized installation on multiple machines. You can further simplify the installation process by including a line in your script that copies an existing `mathpass` file to

the appropriate location on the newly installed machine. Note that `MathInstaller` must be run from the directory in which it is located, so your script may require a command to change directory. See "Registrations and Passwords" for information on sitewide `mathpass` configurations.

Launching Mathematica on Unix and Linux

Launching Mathematica Locally

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

To Launch *Mathematica*:

Make sure that you are running *MathLM*. Then, from a shell, type `mathematica` and press `Enter`.

Alternatively, if you are running X, an additional menu folder named **Wolfram** has already been added to the desktop menu. In the folder, an item named **Mathematica** points to the most recently installed version of *Mathematica*. File associations have also been modified such that `.nb` files now associate with the most recently installed version of *Mathematica*.

To Launch Only the *Mathematica* Kernel:

From a shell, type `math` and press `Enter`.

Launching Mathematica from a File Server

Rather than installing *Mathematica* on every client machine, you can install *Mathematica* on a file server and export the installation directory to the clients. To display the front end, the clients must have access to the *Mathematica* fonts. For information about configuring the X server on the client machines to find the *Mathematica* fonts, see "Fonts on Unix and Linux". Once the fonts are properly configured, the client machines can run *Mathematica* as though it were a local installation.

Mathematica Command-Line Options

math

The `math` command starts the kernel from within a shell. The kernel is the part of *Mathematica* that handles calculations. This is also used by the front end.

Command-Line Options

<code>-initfile file</code>	specify the name of a file containing startup commands
<code>-lmverbose</code>	print diagnostic information to <code>stderr</code>
<code>-mathlink</code>	specify that the kernel should be run in <i>MathLink</i> mode
<code>-noinit</code>	specify that no initialization file should be read at startup
<code>-password str</code>	specify a password to use instead of the password or passwords stored in the <code>mathpass</code> file
<code>-pwfile file</code>	specify the name of a file that has a valid password
<code>-run</code>	specify a command to be run on startup as an argument

`math` command-line options.

The option `-lmverbose` is useful for debugging problems related to the license server.

The option `-mathlink` can also be used as a command-line option for the *Mathematica* front end. See www.wolfram.com/solutions/mathlink for additional information about *MathLink*.

The string for `-password` should have the form `!servername` or `machinename mathid licensenumber password`.

mathematica

The `mathematica` command runs the X front end. In order for the front end to run, the `DISPLAY` environment variable must be set and the front end must be able to locate the fonts included with *Mathematica*.

Command-Line Options

<code>-backgroundTaskDelay n</code>	specify the time (in milliseconds) that the front end delays background tasks while waiting for input
<code>-cleanStart</code>	ignore stored caches and rebuild the front end preferences file
<code>-copyright</code>	display copyright information on the command line
<code>-dontUpdatePrefs</code>	prevent changes to the user's preference settings
<code>-font f</code>	specify the font used in menus, buttons, etc.
<code>-help</code>	display a list of all command-line options
<code>-lmverbose</code>	print diagnostic information to <code>stderr</code> when connecting to <i>MathLM</i>

<code>-mathlink</code>	make the front end run as a child process that is capable of accepting <i>MathLink</i> packets
<code>-nogui</code>	prevent the display of any kind of window or dialogs
<code>-noSplashScreen</code>	prevent the splash screen from being displayed on startup
<code>-noTrueTypeFont</code>	prevent the use of TrueType font in the display
<code>-preferencesDirectory dir</code>	specify the location where preference settings are stored
<code>-primaryModifierMask mask</code>	specify the primary mask to be used as the command key
<code>-pwfile file</code>	specify a file in which to look for <i>Mathematica</i> passwords
<code>-pwwpath p</code>	specify the search path for a password file
<code>-secondaryModifierMask mask</code>	specify the secondary mask to be used as the command key
<code>-singleLaunch</code>	allow only one copy of the front end per display
<code>-stderrWindow</code>	send <code>stderr</code> to a popup window instead of a terminal
<code>-style s</code>	specify the widget style used by the front end
<code>-topDirectory dir</code>	specify the location of the <i>Mathematica</i> installation directory
<code>-version</code>	print the current version of the front end on the command line

`mathematica` command-line options.

The default for `-backgroundTaskDelay` is 100 milliseconds.

The option `-cleanStart` will ignore the caches stored in the directory `$UserBaseDirectory/FrontEnd/7.0_Caches`, and will rebuild the front end preferences file, `$UserBaseDirectory/FrontEnd/init.m`. This option can also be abbreviated as `-clean`.

When using `-font`, a list of possible font names can be found by using `xfontsel`. The name can be expressed either as an X Logical Font Description or as a valid font alias.

The option `-lmverbose` is useful for debugging problems related to the license server.

The option `-mathlink` may be useful when the front end is used as a typesetting or graphics rendering service. See www.wolfram.com/solutions/mathlink for additional information about *MathLink*.

The default directory for `-preferencesDirectory` is `~/.Mathematica`.

The option `-singleLaunch` will prohibit multiple front end launches only if the current front end was launched with the `-singleLaunch` option.

Valid styles for `-style` are `motif`, `motifplus`, `windows`, `cde`, `platinum`, `sgi`, and `compact`.

The default location for `-topDirectory` is `/usr/local/Wolfram/Mathematica/7.0`.

Testing the Installation on Unix and Linux

The following simple commands allow you to test the installation of *Mathematica*. Running these commands does not guarantee that the installation was successful, but a failed command can indicate that a serious problem occurred during installation.

You should run these tests from a regular user account and not from an account with administrator privileges.

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

If you run into problems when doing these tests, see the troubleshooting tips in "Troubleshooting on Unix and Linux". If you do not find the answer there, check the Technical Support website at support.wolfram.com/mathematica.

To Test the Kernel:

1. To start the kernel, type `math` in a shell and press `Enter`.

```
In[1]:=
```

2. Type `N[Pi, 20]` and press `Enter`. The number in the output should match the output shown here.

```
In[1]:= N[Pi, 20]
```

```
Out[1]= 3.1415926535897932385
```

```
In[2]:=
```

3. To exit the kernel, type `Exit` and press `Enter`.

On Unix and Linux, you can test the kernel on a remote machine by using the command `ssh hostname /usr/local/bin/math`. (The exact pathname could be different depending on how *Mathematica* was installed.) This command will launch the kernel on the remote machine *hostname*. When you see the `In[1]` label, follow step 2 and step 3 in the previous instructions.

To Test the Front End:

1. Make sure that you are running X. Launch *Mathematica* by typing `mathematica` in a shell and pressing `Enter`.

Alternatively, you can select **Mathematica** from the menu folder **Wolfram**.

A splash screen with initialization information appears briefly, after which an empty notebook and the **Welcome Screen** appear.

2. Type `N[Pi,20]`. Then hold down the Shift key and press Enter to evaluate. This should send the command to the kernel and return the same result as before. The `In[1]` and `Out[1]` labels are prepended once the evaluation is completed.

In the notebook window, there should be a horizontal line across the notebook; this is the horizontal insertion bar. If you do not see one, move the pointer until it becomes a horizontal I-beam and click once to see the insertion bar.

3. Press the Esc key. You should see three small horizontal lines in a column (`⋮`). Type `int` and press Esc again. You should see an integral sign (`∫`). As an additional font check, typing `\[CheckmarkedBox]` and `\[CirclePlus]` should print the symbols `☑` and `⊕`, respectively. If the symbols show up correctly, the fonts have been properly installed.
4. From the **Help** menu, choose **Documentation Center**. The *Mathematica* Documentation Center should appear.

On Unix and Linux, you can test the X front end remotely, provided the ssh server on the remote machine allows X forwarding. You must be running X on the local machine to do this. In a shell, type `ssh -X hostname /usr/local/bin/mathematica`. (The exact pathname could be different depending on how *Mathematica* was installed.) This command will launch *Mathematica* on the remote machine `hostname`. When the splash screen appears on your screen, follow step 2 and step 3 in the previous instructions.

Configuration Files on Unix and Linux

Mathematica stores preference settings and initialization data in two directories, `$BaseDirectory` and `$UserBaseDirectory`. Within each of these directories are several possible subdirectories with titles such as `FrontEnd`, `Kernel`, and `Licensing`.

- Global settings that affect all users are stored in subdirectories of the directory `$BaseDirectory`. The default value of `$BaseDirectory` on Unix and Linux is `/usr/share/Mathematica`. To redefine the location of global preference settings and initialization data, set the environment variable `MATHEMATICA_BASE`.
- Settings that only affect a particular user are stored in subdirectories of the directory `$UserBaseDirectory`, which is typically a subdirectory of the user's home directory. The default value of `$UserBaseDirectory` on Unix and Linux is `~/.Mathematica`. To redefine the location of user preferences and initialization data, set the environment variable `MATHEMATICA_USERBASE`.

Settings in the directory `$UserBaseDirectory` override global settings defined in the directory `$BaseDirectory`.

In the pathnames that follow, replace the variables `$BaseDirectory` and `$UserBaseDirectory` with the appropriate directories for your system. To find their locations on your system, evaluate the command `$BaseDirectory` (or `$UserBaseDirectory`) in a *Mathematica* notebook.

Kernel

The initialization files used by the kernel contain *Mathematica* commands that are evaluated at startup, such as function definitions, packages to load, or kernel option settings. These commands are also available to the *Mathematica* front end.

```
$BaseDirectory/Kernel/init.m
```

This file is used to initialize the kernel and therefore should store any kernel commands that are appropriate for all users running the kernel.

```
$UserBaseDirectory/Kernel/init.m
```

This file stores user-specific commands used to initialize the kernel.

Kernel initialization files are not created automatically.

Front End

Front end initialization files store preference settings such as the values of global options in the Option Inspector. These files are automatically updated by *Mathematica* when you change a setting in the front end. To make changes to this file, make your changes from within *Mathematica* rather than editing the file directly.

```
$BaseDirectory/FrontEnd/init.m
```

This file stores systemwide defaults used by all *Mathematica* front ends. The settings in this file affect all users. "Systemwide Defaults on Unix and Linux" explains how to implement changes to this global file.

```
$UserBaseDirectory/FrontEnd/init.m
```

This file defines settings within the front end that are specific to each user.

```
$UserBaseDirectory/FrontEnd/7.0_Caches/
```

This directory within the user's home directory stores information on system settings that are read by the front end.

Front end initialization files are created automatically.

Passwords

Passwords are stored in the `mathpass` file, described in further detail in "Registration and Passwords". In the following pathname, replace the variable `$InstallationDirectory` with the directory where you installed *Mathematica*. The default value of `$InstallationDirectory` on Unix and Linux is `/usr/local/Wolfram/Mathematica/7.0`. To find the value of `$InstallationDirectory` on your system, evaluate the command `$InstallationDirectory` in a *Mathematica* notebook.

```
$BaseDirectory/Licensing/mathpass
```

This is the default location for the global password file.

```
$InstallationDirectory/Configuration/Licensing/mathpass
```

This is an alternative location for the global password file.

```
$UserBaseDirectory/Licensing/mathpass
```

While this is not normally the location for the password file, a user-specific `mathpass` file can be stored here.

Systemwide Defaults on Unix and Linux

If you have installed *Mathematica* in a location where multiple users run it (for example, on a file server or multi-user machine), then you can set up systemwide defaults for the *Mathematica* front end and kernel. This is ideal for setting up *Mathematica* for use in computer labs and classrooms. If you share the directory `$BaseDirectory` across the network, these defaults will also take effect on local installations that use the shared `$BaseDirectory`.

The following instructions assume that `$BaseDirectory` and `$UserBaseDirectory` have their default values, `/usr/share/Mathematica` and `~/.Mathematica` respectively.

To Set Up a Configuration File for the Front End:

1. Launch *Mathematica*, and set up any changes to the front end that you need. For example, you may want to modify default file locations, language options, or menu settings.
2. Quit *Mathematica*.
3. Copy the file `~/.Mathematica/FrontEnd/init.m` to the directory `/usr/share/Mathematica/FrontEnd`.

These settings will now be used by the front end unless overridden by the local `init.m` file stored in the user's directory `~/.Mathematica/FrontEnd`.

To Set Up a Configuration File for the Kernel:

1. Launch *Mathematica*, and create a new file.
2. Add any *Mathematica* commands that should be evaluated on startup. For example, you may want to add a function definition or display a message at startup. Enter all the commands in the same cell, separating commands with semicolons.
3. Make this cell an initialization cell by selecting the cell bracket and then choosing **Cell ► Cell Properties ► Initialization Cell**.
4. When you have finished making your changes, choose **File ► Save** and select **Mathematica Package** from the **Save as type** popup menu. Then save the file as `/usr/share/Mathematica/Kernel/init.m`.

These commands will be evaluated when users launch *Mathematica*. If you added a function definition, that function will be available to all users.

Fonts on Unix and Linux

Dealing with fonts under Unix and Linux can sometimes be tricky. The important issues in dealing with fonts in *Mathematica* are presented here for your convenience.

Font Formats

The *Mathematica* front end supports BDF, TrueType, and Type1 fonts. These fonts are automatically installed by `MathInstaller` during installation.

Font Installation

All machines that display the front end must have access to the fonts included with *Mathematica*. If the *Mathematica* process is running on a remote machine and the front end is displayed on the local machine, the X server on the local machine must know where to find the *Mathematica* fonts. To do this, add the *Mathematica* fonts to the local font path by running a command like the following on the local machine.

```
xset fp+ /usr/local/Wolfram/Mathematica/7.0/SystemFiles/Fonts/Type1; xset fp  
rehash
```

Be sure to execute `xset fp rehash` to make the fonts available to the local X server.

For optimal onscreen performance, Type1 fonts should appear before BDF fonts in the font path. Hence, `$InstallationDirectory/SystemFiles/Fonts/Type1` should appear before `$InstallationDirectory/SystemFiles/Fonts/BDF`. You can check the order of the font path by executing the command `xset q`.

Note: TrueType fonts are automatically loaded and do not require an `xset` command.

Font Servers

You may prefer not to install local copies of the *Mathematica* fonts on all machines. You can instead set up a font server with all the necessary *Mathematica* fonts. The other machines on the network can then find the fonts as needed by reading them from the *Mathematica* directory on the font server. Consult your operating system's documentation for further information.

Common Font Errors

On some systems, the font path is limited in length, and it is possible to receive `xset: bad font path element` errors even if the fonts are available to the server. In this case, try reordering the font path and adding the directories for the *Mathematica* fonts earlier in the path. The directory `$InstallationDirectory/SystemFiles/Fonts/Type1` must be listed before `$InstallationDirectory/SystemFiles/Fonts/BDF` on the font path for optimal onscreen performance.

Fonts and Printing

When the X front end prints a notebook, it uses AFM files for the font metrics needed for printing. If you want to print using a particular font not included with *Mathematica*, you will need the AFM files for the font. These files are installed in either `$InstallationDirectory/Configuration/Fonts/AFM`, `/usr/lib/AFM`, or `/usr/lib/afm`. Fonts are normally downloaded to the printer by the front end when printing. You may be able to download the fonts and store them on the printer. See the documentation and programs that came with your printer for more information.

GhostScript

If you want to view *Mathematica* graphics using GhostScript, you need to make GhostScript aware of the *Mathematica* fonts. For more information, contact Technical Support by sending email to support@wolfram.com, or visit support.wolfram.com/mathematica/graphics/export/ghostscript.html.

Troubleshooting on Unix and Linux

If you have problems using *Mathematica* on Unix or Linux, check this list for solutions.

CD or DVD

- Make sure the CD or DVD is properly mounted with the correct `mount` command (see "Mounting a CD or DVD on Unix and Linux"). If the filenames on the CD/DVD appear in the wrong case, it means the CD/DVD is mounted incorrectly.

Installation

Make sure to run the installer from the directory in which it is located.

Passwords

If the front end password dialog box appears when you launch *Mathematica*, either *Mathematica* could not locate the `mathpass` file or there was no valid password in the `mathpass` file. To resolve this problem, first check that there is a `mathpass` file in one of these directories: `/usr/share/Mathematica/Licensing`, `$InstallationDirectory/Configuration/Licensing`, or `~/.Mathematica/Licensing`. If you did not find a `mathpass` file in these locations, follow the instructions in "Entering a Single-Machine Password" to reenter your password.

If there is a `mathpass` file in one of those directories, the password or passwords are invalid. Make sure that your MathID number matches the MathID number used to issue your password. If your MathID number changes, you will need to contact Customer Service to get a new password. Contact information is provided in "Registration and Passwords".

Paths

By default, the front end runs the command `math` to start the kernel. If `math` is not on the path, then you must use the **Kernel Configuration Options** command in the **Kernel** menu to specify the full pathname of the `math` command.

Front End Preferences

Front end preferences, such as the names of recently opened and saved files, are stored in `~/.Mathematica/FrontEnd`. The most convenient way to reset the front end preferences to their default values is to restart *Mathematica* using the command `mathematica -cleanStart`. This will cause the initialization file to be rebuilt automatically.

Caches

Information about your *Mathematica* layout, such as the locations of text resource files, is stored in caches. These caches are located in the directory `~/.Mathematica/FrontEnd/7.0_Caches`. A corrupted cache may cause the front end to produce an error or quit immediately on startup. The most convenient way to reset the caches to their default values is to use the option `-cleanStart` at startup. This will cause the *Mathematica* caches and the initialization file to be rebuilt automatically. If you want to rebuild your caches but retain your preferences, hold down **Shift** during startup. This will delete and rebuild the cache without rebuilding the front end initialization file.

Fonts

- Make sure that the fonts are installed on the machine that displays the front end or on a font server.
- If you see the error `xset: bad font path element`, either the fonts are not properly installed on your machine, or your font path is too long and exceeds the allowable limit. Make sure the fonts are properly installed, or copy the fonts to a directory that is already on the font path.

Technical Support

For further assistance, check the Technical Support FAQs on the web at support.wolfram.com. If you are a Site License Administrator, additional Site License Documentation is available at site.wolfram.com. If you do not find the information you need, please contact Technical Support by sending email to support@wolfram.com or by calling +1-217-398-6500. Include your license number in all correspondence. Your license number is located on your electronic or printed license certificate. It is also available after installation by going to the **Help** menu and clicking **About Mathematica**. You must be a registered user in order to receive installation support. You must have a current *Premier Service* subscription to receive Technical Support.

Mac OS X

Installing Mathematica on Mac OS X

Installing Mathematica for Network Licenses

Requirements

Mathematica is available for Windows, Unix, Linux, and Mac OS X. For a complete list of platform availability, visit www.wolfram.com/products/mathematica/platforms.html. Any supported machine can act as a client for running *Mathematica*, provided the following two conditions are met:

- The client has access to the *Mathematica* files, either locally or from a file server on the network.
- The license server running *MathLM* is available on the TCP/IP network.

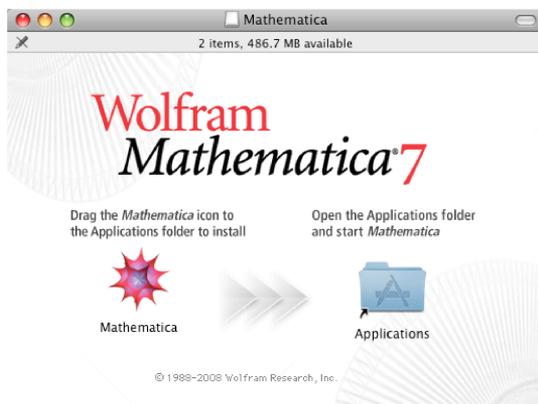
A license server can also function as its own client. However, this is not recommended. If the machine has to be rebooted for any reason, the serving of licenses to all other clients on the network may be disrupted.

Before you install *Mathematica* as a license server client, *MathLM* should already be installed and running on a license server on the network (see "Installing *MathLM*" for details). To complete the *Mathematica* installation, you will need to know the name or IP address of the license server running *MathLM*.

To install *Mathematica* on Mac OS X in the Applications folder, you must log on as administrator.

To Install *Mathematica*:

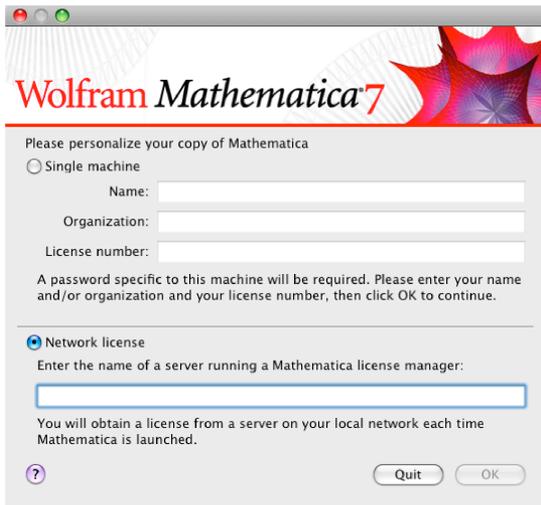
1. Insert the DVD. A new window appears on your screen.



2. Drag the *Mathematica* icon from this window to the location on your hard drive where you want to install *Mathematica*. In order for all users to have access to *Mathematica*, you should install it in the systemwide Applications folder. You must have administrative privileges to do this.

Note: If you are installing over a previous version of *Mathematica*, your existing math-pass file and custom settings will **not** be deleted.

3. When all files have been copied, launch *Mathematica* by opening the folder where you installed *Mathematica* and double-clicking the *Mathematica* icon.
4. *Mathematica* starts up and the following dialog box appears. Select **Network license**. Then enter the name or IP address of the *MathLM* license server in the text field provided.



5. Click **OK**. *Mathematica* launches and is ready for use.

After you install *Mathematica* you can place the *Mathematica* icon into the Dock for easier access. To do this, start *Mathematica*, and hold down the **Ctrl** key while clicking the *Mathematica* icon in the Dock. In the popup menu that appears, choose **Keep in Dock**.

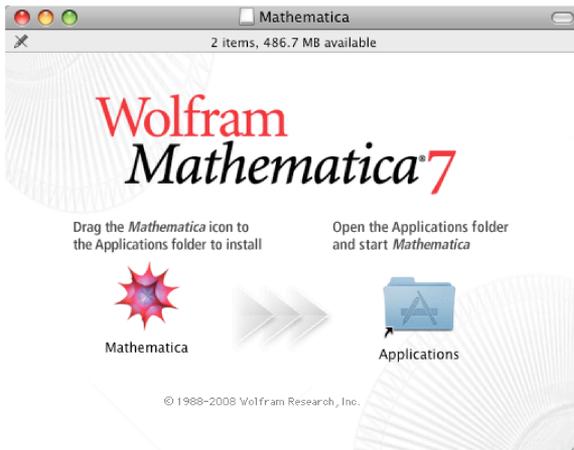
Installing Mathematica for Single-Machine Licenses

Follow these instructions to install a standalone copy of *Mathematica* that does not get a license from the license server. Depending on your license type, this may require contacting Wolfram Research to purchase additional licenses.

To run *Mathematica*, you must register with Wolfram Research and receive a password. See "Registration and Passwords" for further information.

To Install a Single-Machine Copy of *Mathematica* on Mac OS X:

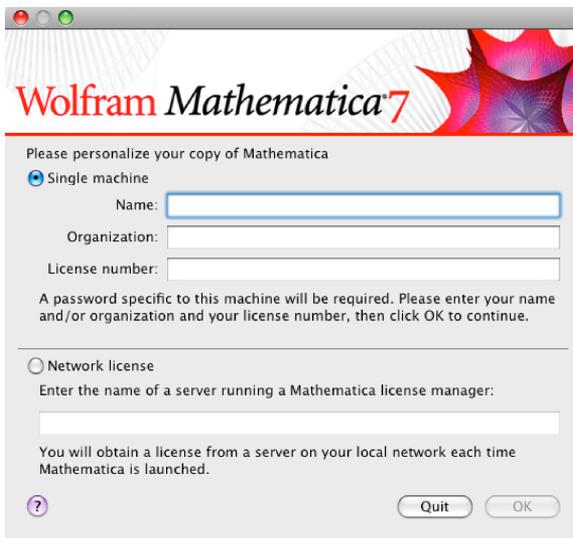
1. Insert the *Mathematica* DVD. A new window appears on your screen.



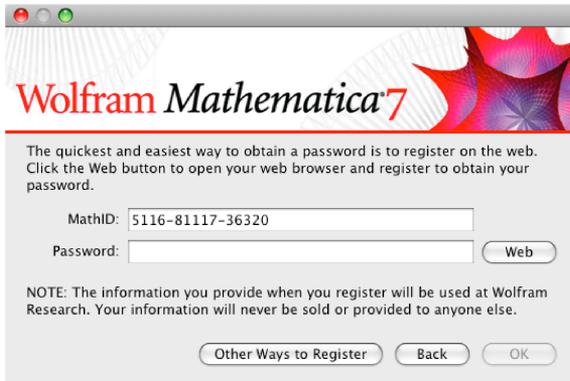
2. Drag the *Mathematica* icon from the window to the location on your hard drive where you want to install *Mathematica*.

Note: If you are installing over a previous version of *Mathematica*, your existing math-pass file and custom settings will **not** be deleted.

3. When all files have been copied, launch *Mathematica* by opening the folder where you installed *Mathematica* and double-clicking the *Mathematica* icon.
4. *Mathematica* starts up and the following dialog box appears. Select **Single machine**. Enter your name, the name of your organization, and your license number (located on your electronic or printed certificate) in the text fields provided. Click **OK** when you are done.



- The following dialog box appears showing the MathID number for your machine. To obtain your password, click the **Web** button, go to register.wolfram.com, or contact Wolfram Research (see "Registration and Passwords" for further information). You will need to supply your license number and your MathID number.



- Enter your password and click **OK**. You are now ready to start using *Mathematica*.

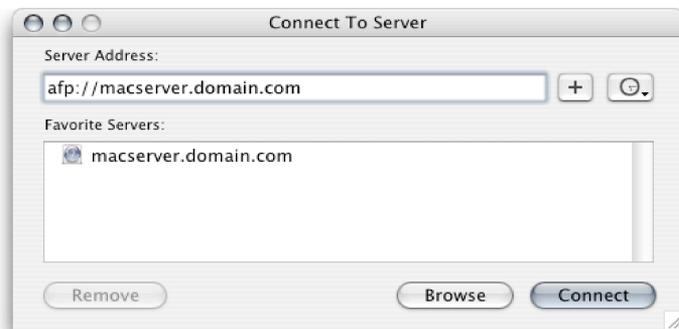
Installing Mathematica from a File Server

One convenient way to install *Mathematica* on a client is to copy the files from a file server on the network. This is an efficient way of making *Mathematica* available to a large number of users without having to supply a DVD to each user.

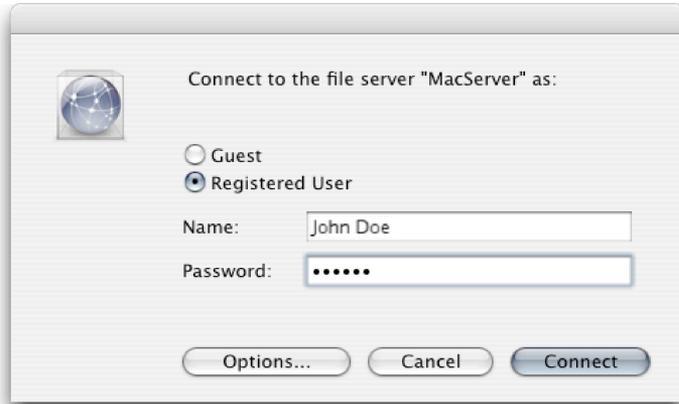
Before following these instructions, *Mathematica* should be installed on the file server according to the instructions in "Network License" and "Single-Machine License".

To Install *Mathematica* from a File Server:

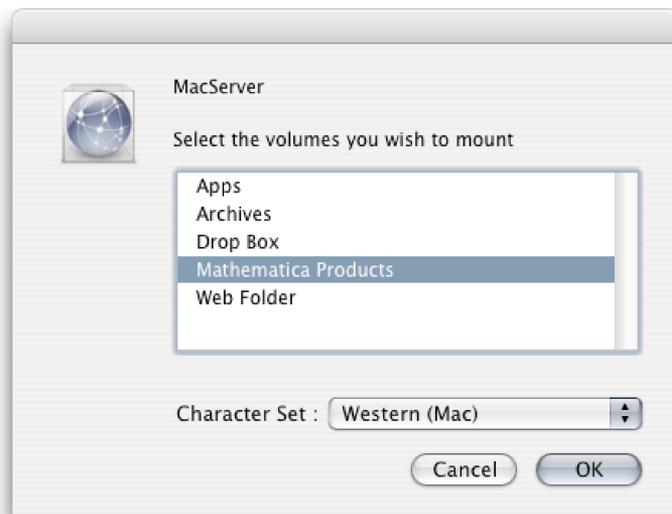
- On the client machine, select **Go ► Connect to Server** in the **Finder** menu.
- In the dialog box that appears, choose a file server from the list or enter the machine name or IP address of the file server in the text field. Then click **Connect**.



3. Enter your name and password in the dialog box that appears. Then click **Connect**.



4. A dialog box appears, showing a list of volumes on the file server. Select the volume in which *Mathematica* is installed. Then click **OK**.



5. The volume you selected is mounted on the client machine. Double-click the icon representing the volume.
6. Navigate to the location where *Mathematica* is installed. Then drag the *Mathematica* package from the file server to the location on the client machine where you want to install *Mathematica*. In order for all users to have access to *Mathematica*, you should install it in the Applications folder. You must log on as administrator to do this.

Launching Mathematica on Mac OS X

Launching Mathematica Locally

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

To Launch *Mathematica*:

Double-click the *Mathematica* icon in the directory where *Mathematica* is installed. Alternatively, if you have placed the *Mathematica* icon in the dock, single-click the icon.

To Launch Only the Mathematica Kernel:

Open the Terminal application and type the full pathname of the **MathKernel** binary in the window that appears. For example, if you installed *Mathematica* in the **Applications** folder, type `/Applications/Mathematica.app/Contents/MacOS/MathKernel` in a **Terminal** window and press `Return`.

Launching Mathematica from a File Server

To maintain a centralized location for preferences and password files or to save disk space, you can run *Mathematica* directly from a file server. To do this, the client machine does not need to have any *Mathematica* files installed locally.

To Run a Copy of *Mathematica* Installed on a Remote File Server:

1. Connect to a file server on which *Mathematica* is installed.
2. Double-click the icon representing the volume with the *Mathematica* files. Then navigate to the location where *Mathematica* is installed.
3. Double-click the *Mathematica* icon in the directory where *Mathematica* is installed.

Mathematica Command-Line Options

The commands `MathKernel` and `Mathematica` have several command-line options used to specify certain configuration information and file locations.

`MathKernel`

The command `MathKernel` starts the kernel, which is the part of *Mathematica* that handles calculations. This command is also used by the *Mathematica* front end.

<code>-initfile file</code>	Specifies the name of a file containing commands to be run on startup.
<code>-lmverbose</code>	Prints diagnostic information to <code>stderr</code> on connecting to the license manager. This is useful for debugging problems related to the license server.
<code>-mathlink</code>	Specifies that the kernel should be run in <i>MathLink</i> mode. See www.wolfram.com/solutions/mathlink for additional information about <i>MathLink</i> .
<code>-noinit</code>	Specifies that no initialization file should be read at startup.
<code>-password str</code>	Specifies a password to use instead of the password or passwords stored in the <code>mathpass</code> file. The password should have the form " <code>!servername</code> " or " <code>machinename mathid licensenumber password</code> ".
<code>-pwfile file</code>	Specifies the name of a file that has a valid password.
<code>-run</code>	Takes a command to be run on startup as an argument.

MathKernel command-line options.

Mathematica

The command `Mathematica` runs the *Mathematica* front end. In order to run *Mathematica* with a command-line option, you must start it from the command line using the **Terminal** application.

<code>-cleanStart</code>	Tells the front end to ignore caches stored in the directory <code>~/Library/Mathematica/FrontEnd/7.0 Caches</code> , and rebuilds the front end preferences file, <code>~/Library/Mathematica/FrontEnd/init.m</code> .
<code>-mathlink</code>	Causes the front end to run in <i>MathLink</i> mode. In <i>MathLink</i> mode, the front end runs as a child process that is capable of accepting <i>MathLink</i> packets. This option may be useful when the front end is used as a typesetting or graphics rendering service.
<code>-preferencesDirectory dir</code>	Specifies the location where preference settings are stored. The default location is <code>~/Library/Mathematica</code> .
<code>-topDirectory dir</code>	Specifies the location of the <i>Mathematica</i> installation directory.

Mathematica command-line options.

Testing the Installation on Mac OS X

The following simple commands allow you to test the installation of *Mathematica*. Running these commands does not guarantee that the installation was successful, but a failed command can indicate that a serious problem occurred during installation.

You should run these tests from a regular user account and not from an account with administrator privileges.

To run *Mathematica* using a network license, both the client machine and the license server must be on the network and *MathLM* must be running.

If you run into problems when doing these tests, see the troubleshooting tips in "Troubleshooting on Mac OS X". If you do not find the answer there, check the Technical Support website at support.wolfram.com/mathematica.

To Test the Kernel:

1. To start the kernel, open the Terminal application and type the full pathname of the MathKernel binary in the window that appears. For example, if you installed *Mathematica* in the Applications folder, type `/Applications/Mathematica.app/Contents/MacOS/MathKernel` in a **Terminal** window and press **Return**.

```
In[1]:=
```

2. Type `N[Pi, 20]` and press **Return**. The number in the output should match the output shown here.

```
In[1]:= N[Pi, 20]
```

```
Out[1]= 3.1415926535897932385
```

```
In[2]:=
```

3. To exit the kernel, type `Exit` and press **Return**.

To Test the Front End:

1. Launch *Mathematica* by double-clicking the *Mathematica* icon.

A splash screen with initialization information appears briefly, after which an empty notebook and the **Welcome Screen** appear.

2. Type `N[Pi,20]`. Then hold down the **Shift** key and press **Enter** to evaluate. This should send the command to the kernel and return the same result as before. The `In[1]` and `Out[1]` labels are prepended once the evaluation is completed.

In the notebook window, there should be a horizontal line across the notebook; this is the horizontal insertion bar. If you do not see one, move the pointer until it becomes a horizontal I-beam and click once to see the insertion bar.

3. Press the **Esc** key. You should see three small horizontal lines in a column (⋮). Type `int` and press **Esc** again. You should see an integral sign (\int). As an additional font check, typing `\[CheckmarkedBox]` and `\[CirclePlus]` should print the symbols \checkmark and \oplus , respectively. If the symbols show up correctly, the fonts have been properly installed.
4. From the **Help** menu, choose **Documentation Center**. The *Mathematica* Documentation Center should appear.

Configuration Files on Mac OS X

Mathematica stores preference settings and initialization data in two directories, `$BaseDirectory` and `$UserBaseDirectory`. Within each of these directories are several possible subdirectories with titles such as `FrontEnd`, `Kernel`, and `Licensing`.

- Global settings that affect all users are stored in subdirectories of the directory `$BaseDirectory`. The default value of `$BaseDirectory` on Mac OS X is `/Library/Mathematica`. To redefine the location of global preference settings and initialization data, set the environment variable `MATHEMATICA_BASE`.
- Settings that only affect a particular user are stored in subdirectories of the directory `$UserBaseDirectory`, which is typically a subdirectory of the user's home directory. The default value of `$UserBaseDirectory` on Mac OS X is `~/Library/Mathematica`. To redefine the location of user preferences and initialization data, set the environment variable `MATHEMATICA_USERBASE`.

Settings in the directory `$UserBaseDirectory` override global settings defined in the directory `$BaseDirectory`.

In the pathnames that follow, replace the variables `$BaseDirectory` and `$UserBaseDirectory` with the appropriate directories for your system. To find their locations on your system, evaluate the command `$BaseDirectory` (or `$UserBaseDirectory`) in a *Mathematica* notebook.

Kernel

The initialization files used by the kernel contain *Mathematica* commands that are evaluated at startup, such as function definitions, packages to load, or kernel option settings. These commands are also available to the *Mathematica* front end.

```
$BaseDirectory/Kernel/init.m
```

This file is used to initialize the kernel and therefore should store any kernel commands that are appropriate for all users running the kernel.

```
$UserBaseDirectory/Kernel/init.m
```

This file stores user-specific commands used to initialize the kernel.

Kernel initialization files are not created automatically.

Front End

Front end initialization files store preference settings such as the values of global options in the Option Inspector. These files are automatically updated by *Mathematica* when you change a setting in the front end. To make changes to this file, make your changes from within *Mathematica* rather than editing the file directly.

```
$BaseDirectory/FrontEnd/init.m
```

This file stores systemwide defaults used by all *Mathematica* front ends. The settings in this file affect all users. "Systemwide Defaults on Mac OS X" explains how to implement changes to this global file.

```
$UserBaseDirectory/FrontEnd/init.m
```

This file defines settings within the front end that are specific to each user.

```
$UserBaseDirectory/FrontEnd/7.0 Caches/
```

This directory within the user's home directory stores information on system settings that are read by the front end.

Front end initialization files are created automatically.

Passwords

Passwords are stored in the mathpass file, described in further detail in "Registration and Passwords". In the following pathname, replace the variable `$InstallationDirectory` with the directory where you installed *Mathematica*. To find the value of `$InstallationDirectory` on your system, evaluate the command `$InstallationDirectory` in a *Mathematica* notebook.

```
$BaseDirectory/Licensing/mathpass
```

This is the default location for the global password file.

```
$InstallationDirectory/Configuration/Licensing/mathpass
```

This is an alternative location for the global password file.

```
$UserBaseDirectory/Licensing/mathpass
```

While this is not normally the location for the password file, a user-specific mathpass file can be stored here.

Systemwide Defaults on Mac OS X

If you have installed *Mathematica* in a location where multiple users run it (for example, on a file server or multi-user machine), then you can set up systemwide defaults for the *Mathematica* front end and kernel. This is ideal for setting up *Mathematica* for use in computer labs and classrooms. If you share the directory `$BaseDirectory` across the network, these defaults will also take effect on local installations that use the shared `$BaseDirectory`.

The following instructions assume that `$BaseDirectory` and `$UserBaseDirectory` have their default values, `/Library/Mathematica` and `~/Library/Mathematica`, respectively.

To Set Up a Configuration File for the Front End:

1. Launch *Mathematica*, and set up any changes to the front end that you need. For example, you may want to modify default file locations, language options, or menu settings.
2. Quit *Mathematica*.
3. Copy the file `~/Library/Mathematica/FrontEnd/init.m` to the directory `/Library/Mathematica/FrontEnd`.

These settings will now be used by the front end unless overridden by the local `init.m` file stored in the user's `~/Library/Mathematica/FrontEnd` directory.

To Set Up a Configuration File for the Kernel:

1. Launch *Mathematica*, and create a new file.
2. Add any *Mathematica* commands that should be evaluated on startup. For example, you may want to add a function definition or display a message at startup. Enter all the commands in the same cell, separating commands with semicolons.
3. Make this cell an initialization cell by selecting the cell bracket and then choosing **Cell ▶ Cell Properties ▶ Initialization Cell**.
4. When you have finished making your changes, choose **File ▶ Save** and select **Mathematica Package** from the **Save as type** popup menu. Then save the file as `/Library/Mathematica/Kernel/init.m`.

These commands will be evaluated when users launch *Mathematica*. If you added a function definition, that function will be available to all users.

Troubleshooting on Mac OS X

Passwords

If the front end password dialog box appears when you launch *Mathematica*, either *Mathematica* could not locate the mathpass file or there was no valid password in the mathpass file. To resolve this problem, first check that there is a mathpass file in one of these directories: `/Library/Mathematica/Licensing`, `$InstallationDirectory/Configuration/Licensing`, or `~/Library/Mathematica/Licensing`. To find the exact location of `$InstallationDirectory` on your machine, evaluate the command `$InstallationDirectory` in a notebook. If you did not find a mathpass file in these locations, follow the instructions in "Entering a Single-Machine Password" to reenter your password.

If there is a mathpass file in one of those directories, the password or passwords are invalid. Make sure that your MathID number matches the MathID number used to issue your password. If your MathID number changes, you will need to contact Customer Service to get a new password. Contact information is provided in "Registration and Passwords".

Front End Preferences

Front end preferences, such as the locations of recently opened and saved files, are stored in a front end initialization file called `init.m`. This file is located in the directory `~/Library/Mathematica/FrontEnd`. If you need to reset the front end preferences to their default values, hold down `Shift+Option` during startup. This will cause the initialization file to be rebuilt automatically.

Caches

Information about your *Mathematica* system layout, such as the locations of text resource files and help files, is stored in caches. These caches are located in the directory `~/Library/Mathematica/FrontEnd/7.0/Caches`.

A corrupted cache may cause the front end to produce an error or quit immediately on startup. The most convenient way to restore the caches to their default values is to hold down `Shift+Option` during startup. This will cause the *Mathematica* caches and the initialization file to be rebuilt automatically.

If you want to rebuild your caches but retain your preferences, hold down **Shift** during startup. This will delete and rebuild the cache without rebuilding your front end initialization file.

Technical Support

For further assistance, check the Technical Support FAQs on the web at support.wolfram.com. If you are a Site License Administrator, additional Site License Documentation is available at site.wolfram.com. If you do not find the information you need, please contact Technical Support by sending email to support@wolfram.com or by calling +1-217-398-6500. Include your license number in all correspondence. Your license number is located on your electronic or printed license certificate. It is also available after installation by going to the **Help** menu and clicking **About Mathematica**. You must be a registered user in order to receive installation support. You must have a current *Premier Service* subscription to receive Technical Support.

