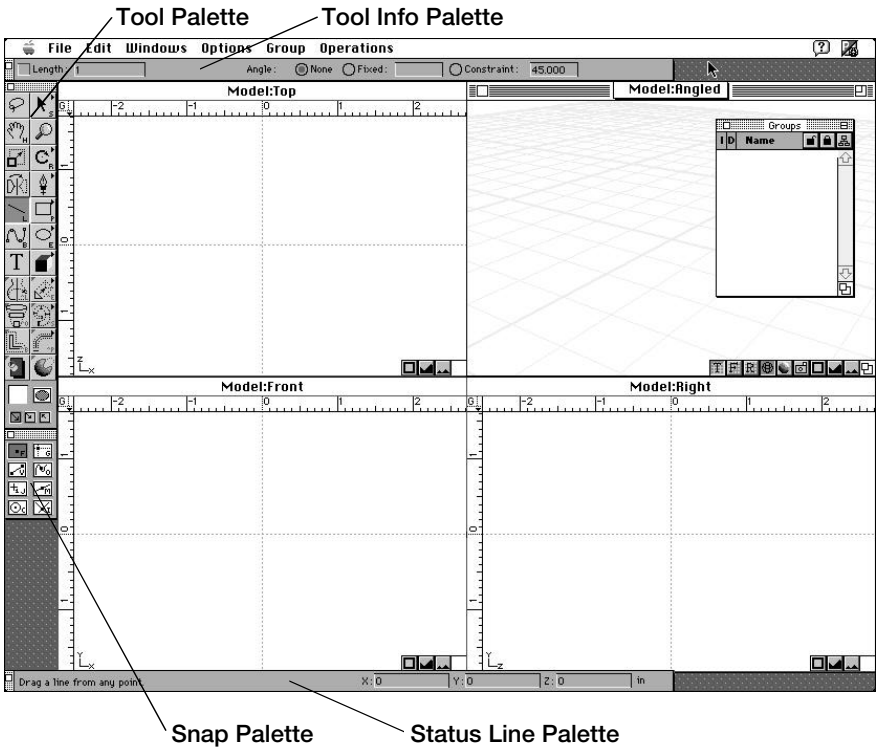
The ModelPro Windows

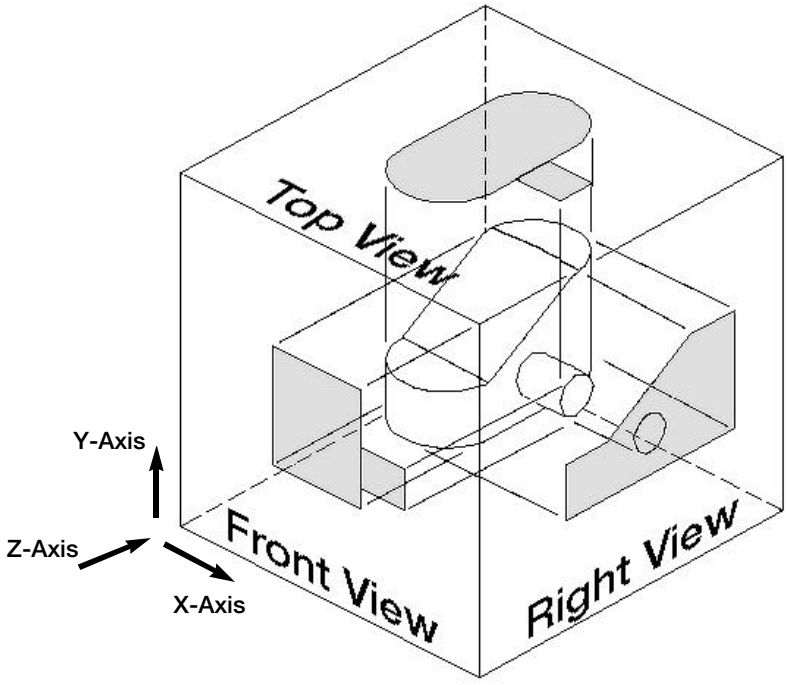
The figure below shows the screen as it comes up after launching ModelPro.



Note: By default, the View Windows come up with a gray background. They are shown here with a white background for clarity. You can set any background color you like using Preferences / Color in the Edit Menu.

In this chapter we will discuss the four viewing windows; the Top View, Front View, Right View, and Angled View windows. These four View Windows are used to display the model space in which you work.

The Top, Front, and Right, are all Orthogonal Views. That is to say that in each of these views, the camera is looking right along one of the primary axes—X, Y or Z. The fourth view, the Angled View, is used for rotating your view around the model, and looking at it from any angle in 3D space. It is possible to draw in all four view windows.



Orthogonal Views

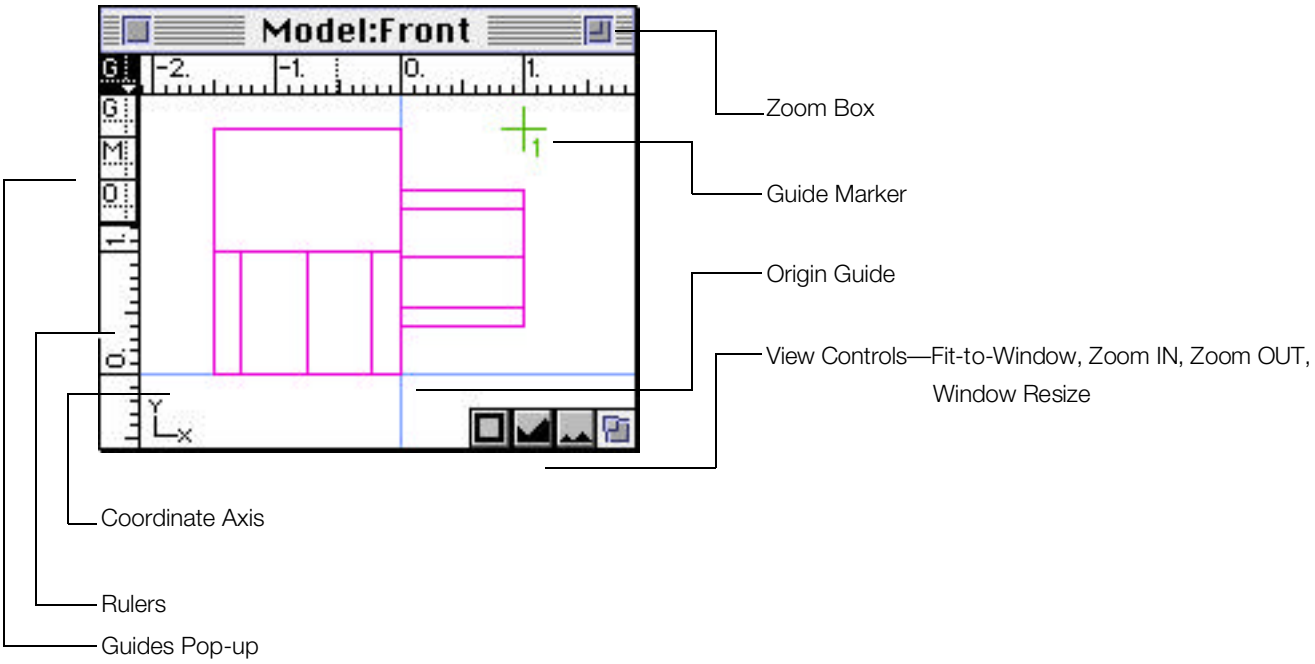
The Top, Front and Right windows each present an orthographic view of the model. Each view is fixed in relation to the other two (90° rotation), and together give you an undistorted view of all three principal dimensions (length, width and depth) of the model. There is no perspective distortion in the orthogonal views.

Rulers

Each of the Orthogonal View windows has a ruler at the top and left edge, and in the lower-left corner, a fixed display of which plane you are viewing: Top (x-z), Front (x-y), and Right (z-y).

Guides

The top-left corner of each View window, where the rulers meet, is the Guide pull-down. There are three types of Guides: Guide-Lines, Guide-Markers, and an Origin Guide. Select the desired Guide by highlighting it in the pull-down. To pull out a Guide, click-hold-drag the guide out into its View window, and “drop” it at the desired location.



Fit to Window button

Clicking on this sizes the entire extent of your scene to fit within the window. This does not affect the dimensions of your scene, only the scale factor of a given window.

Zoom In/Out buttons

Clicking or holding on these buttons moves your viewer position closer to/further from the model. This does not affect the dimensions of your scene, only the scale factor of a given window.

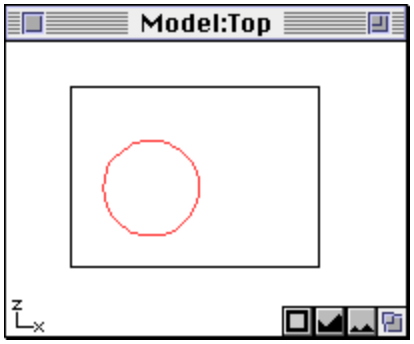
Window Resize

Click-hold-drag this box to resize the entire view Window. This affects only the on-screen display of the Window, and does not affect the scene in any way. The Zoom box located at the top, right of the Window toggles the display of the Window between full-screen and the size you have set with the Window Resize box. Double-click in the window title bar to operate the Zoom box function.

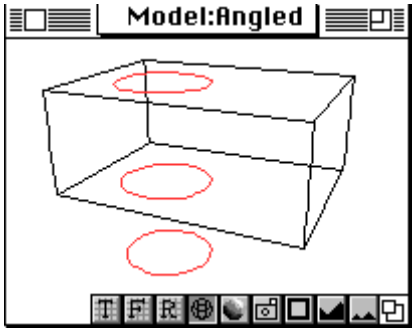
Hint: use the Hand tool to intuitively reposition your view of the model in the Orthogonal View windows. Click-drag in a View window to change your position relative to the model. This does not reposition the model.

Working with Depth in the Orthogonal Views

When creating geometry in one of the Orthogonal Views, the location of each click is clearly defined both horizontally and vertically by the location of the cursor on the screen. But it is not always so clear about the location of the click on the axis that goes in and out of the screen.



The circle shown above correctly represents any of these circles shown in the 3D view below. In fact, it could represent many possible circles.



The grid that appears when you enable one of these three buttons is the Depth Plane for the Top or Front or Right View.

As a simple example, say a circle is drawn inside the boundaries of a rectangle in the Top View. The rectangle is a projection of a cube. The actual location of that circle in 3D space has many possible solutions. The circle could lie completely in the top face. It could lie completely in the bottom face. Or it could lie in any plane above, below, or in the middle of the cube.

What is needed is a way to control depth so that the circle gets drawn in the right location the first time and every time. Here is how ModelPro handles this situation:

At all times, there is a “work plane” defined in ModelPro for each of the three orthogonal directions. It is on these three work planes that new geometry gets placed by default (unless the user specifies otherwise).

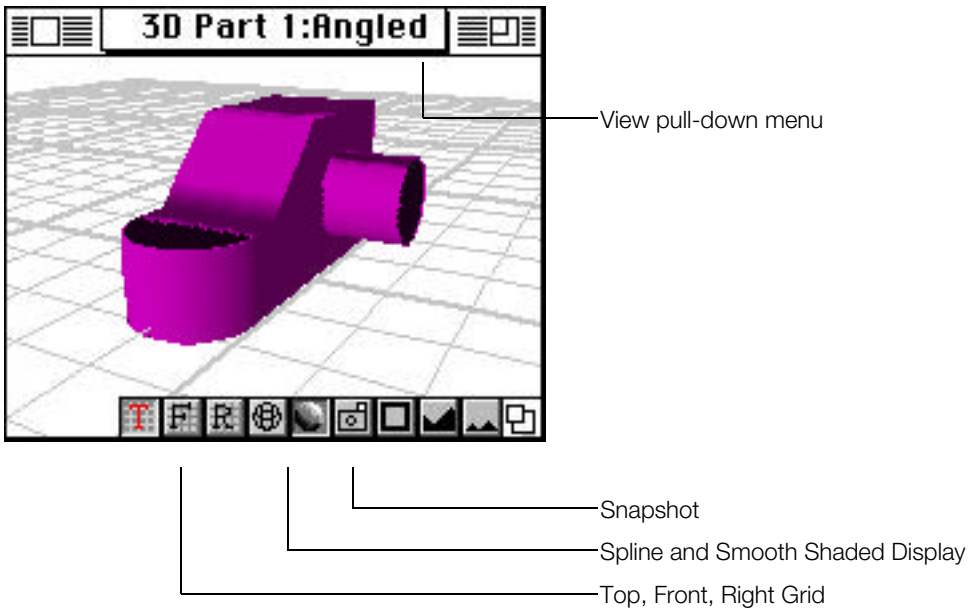
The three perpendicular planes intersect at a single point or origin. This “origin” is called the Depth Origin. In each of the three views, the Depth planes are seen as lines that go through this “origin.” They are called the Depth Lines.

By default, the Depth Origin starts out at the same location as the world origin. But it can be moved, and in fact, it needs to be moved quite often to specify the location for new geometry.

To define a new location for the Depth Origin, do the following

1) Position the cursor in one of the Orthogonal views at the point where the new Depth Origin needs to be.
2) Press the Space Bar.

That's it! The Depth Lines appear at the new cursor location. Do the same in other views to set the Depth Origin in all three axes.



Angled View

In addition to the common display control buttons (described in the Orthogonal View windows section), the Angled view has six others: Top/Front/Right Grid display, Spline display, Smooth-shaded display, and Snapshot.

Top/Front/Right Grid display

Click on the desired button to toggle the display of that Grid "on" and "off." Only one Grid at a time will display. The Grid displayed corresponds to the plane of the Depth Lock (see Depth Lock discussion preceding).

Spline display

Click on this button to display the model as spline shapes.

Smooth-shaded display

Click on this button for a smooth-shaded display of the model. There is one fixed light source for this shaded view.

Snapshot

Click on this button to take a “picture” of the model in the Angled View. A standard Save dialog box will appear to prompt you for a save location for the Snapshot. This will save the Snapshot as a PICT at the screen resolution.

View pull-down menu

Click-hold here to expose the pull-down menu listing: Top, Bottom, Front, Back, Left, and Right to set the position of the viewer relative to the model. This is useful if you have been intuitively viewing the object, and wish to return your view position to some known point.

Enable/disable the Perspective function of the Angled View from this pull-down as well. If Perspective does not have a check mark next to it, the View is a “flat” orthographic projection. With Perspective enabled the View is a “real world” view of the model, with full perspective.

Using the Angled View Window

Use the Hand tool to intuitively reposition your view relative to the model. The Hand icon changes to crossed-arrows over the Angled View. Click-drag in the Angled View to reposition your view. It will appear as though the model is spinning about its center. However, this does not affect the model. Press the Command key (magnifier) and drag the magnifier in the Angled View to intuitively zoom in/out. Press the Option key (Hand) and drag the Hand in the Angled View to intuitively change your view up/down and left/right.

Visualization in 3-D

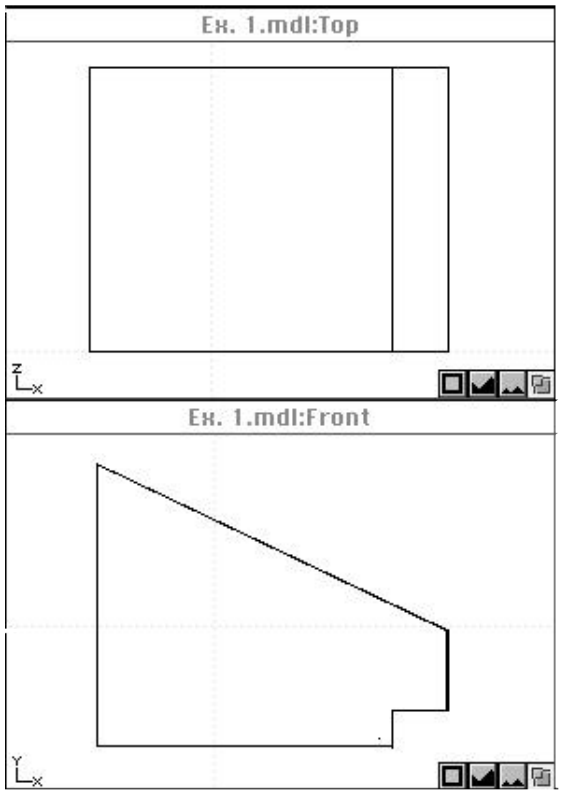
If you already have experience in 3-D modeling, skip this section.

In order to become more familiar with orthogonal views and how to visualize in three dimensions, use a pencil and paper to do the following exercises. The solutions are shown on the following pages.

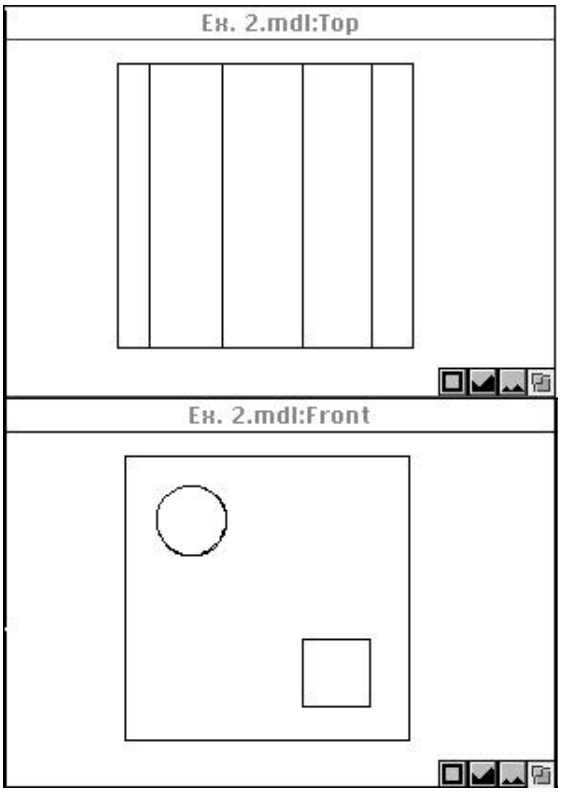
For each exercise, study the two views given, then draw what you think the third view should be. Note that the three views fully define the object in three dimensional space.

Proceed with caution if you are unsuccessful, or are confused regarding visualizing in three dimensions. A clear grasp of these concepts is important to 3-D modeling.

Exercises

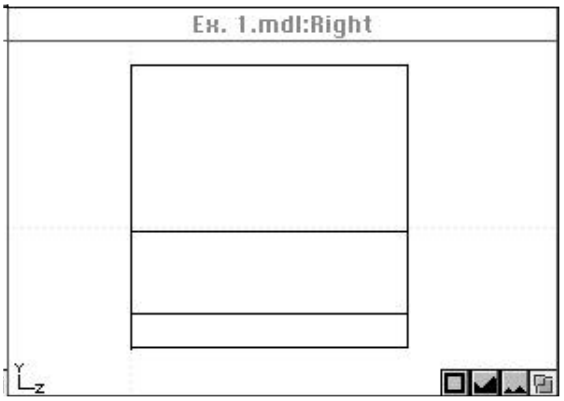


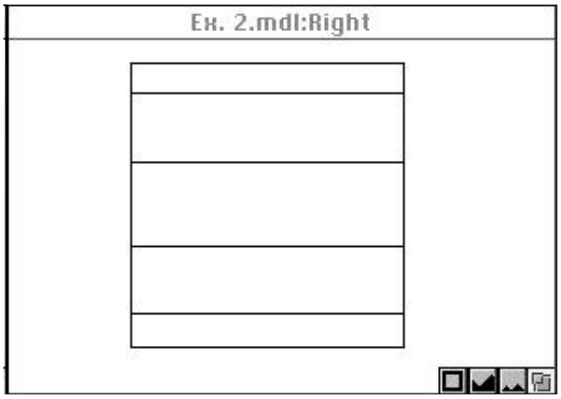
Exercise 1

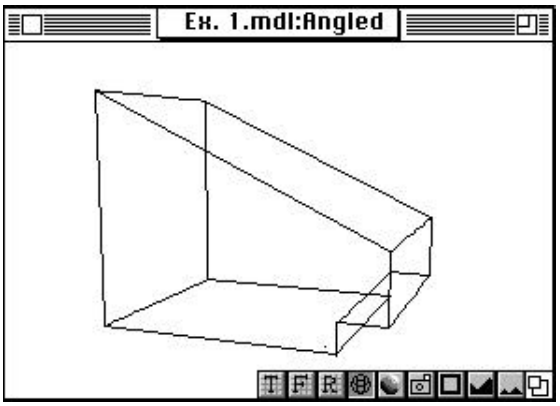


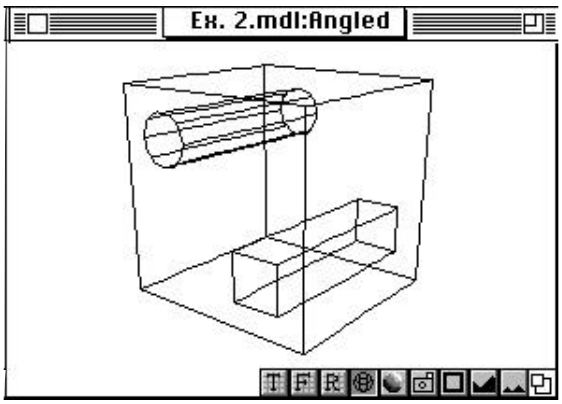
Exercise 2

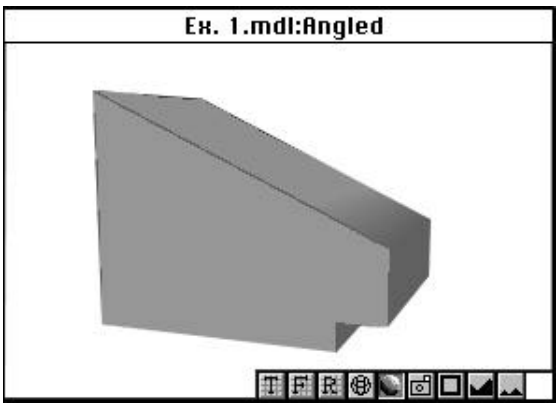
Exercise Solutions

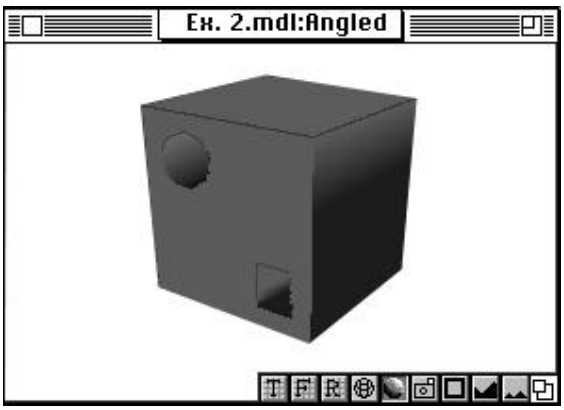








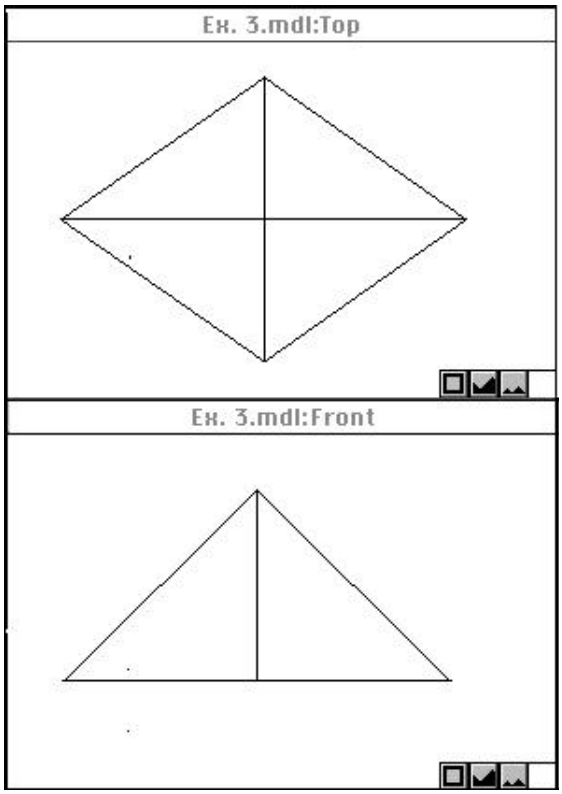




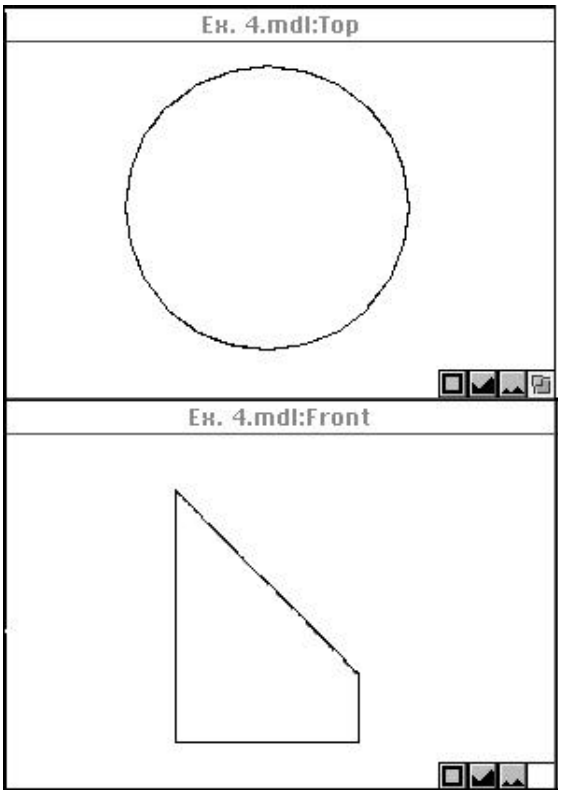
Solution 1

Solution 2

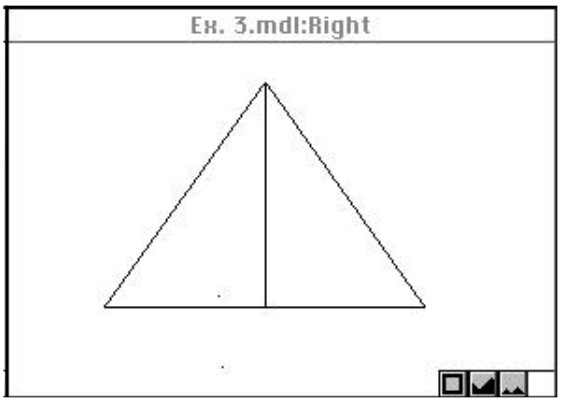
Exercises *continued*

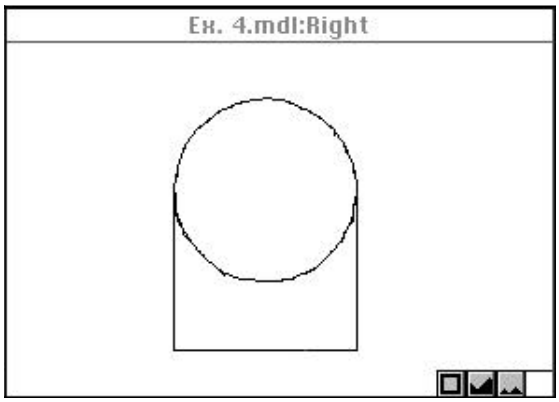


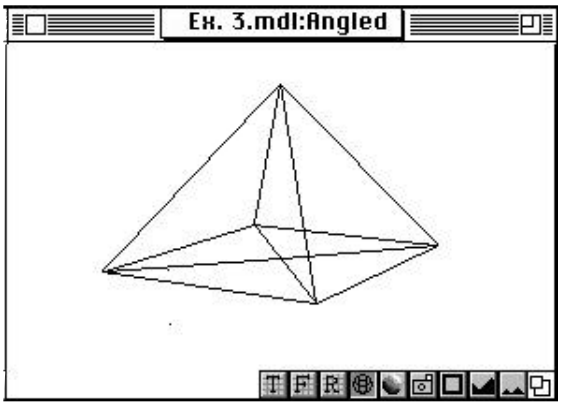
Exercise 3

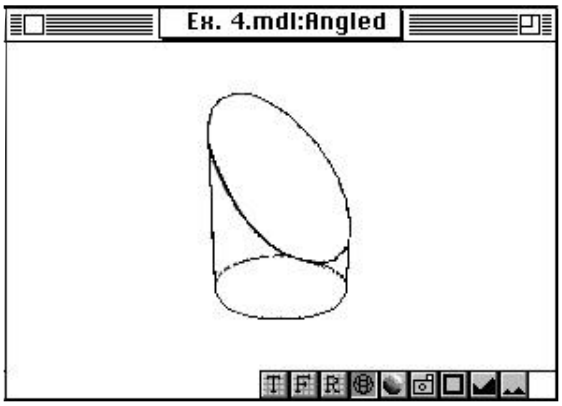


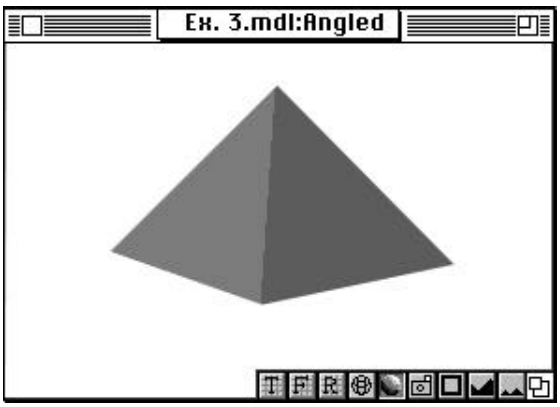
Exercise 4



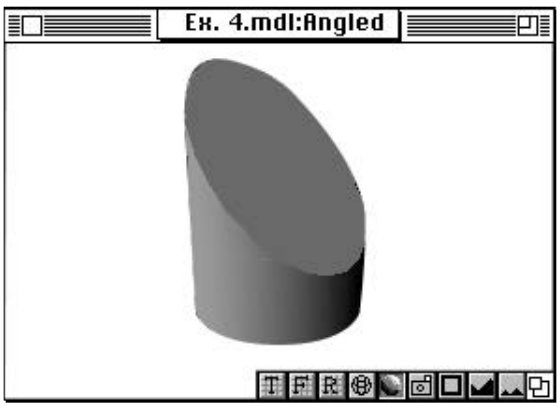








Solution 3



Solution 4