

# ***The Geometer's Sketchpad® 4***

## **The Menus**

**File:** Used to open, save, close, and print documents.

**Edit:** Used to undo and redo actions.

**Display:** Used to control an object's appearance, and to label/hide/animate objects.

**Construct:** Used to construct new geometric objects based on selected objects in your sketch.

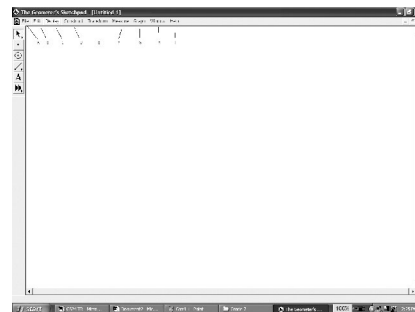
**Transform:** Used to apply geometric transformations to selected objects.

**Measure:** Used to give various measures based on selected objects in a sketch.

**Graph:** Used to create grids and axes for plotting points.

**Window:** Used to manipulate windows within *The Geometer's Sketchpad®*.

**Help:** Used to access the available help files.



## **The Toolbox**

**Selection Arrow Tool:** Used to select, move, and transform objects in a sketch.

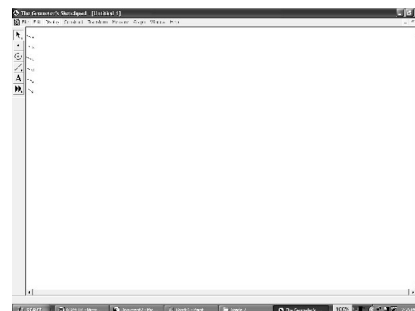
**Point Tool:** Used to draw and plot points.

**Compass Tool:** Used to draw circles.

**Straightedge Tool:** Used to draw line segments, lines, and rays.

**Text Tool:** Used to label/unlabel points and lines, and to write text or captions within a sketch.

**Custom Tool:** Allows you to define and use custom tools.



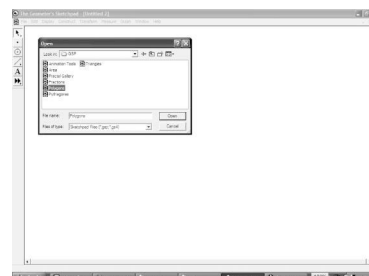
## **Creating a New Sketch**

- To create a new sketch window, on the **File** menu, click **New Sketch**.

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## Opening an Existing Sketch

- On the **File** menu, click **Open...**
- Navigate to the directory in which the sketch you wish to open is saved.
- Click the name of the sketch you wish to open. Click **Open**.



## Saving a Sketch

To save a sketch for the first time:

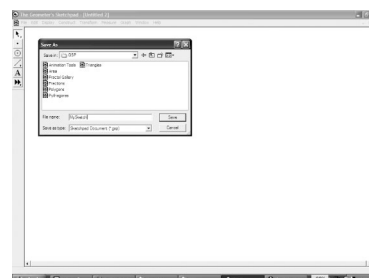
- on the **File** menu, click **Save**
- navigate to the directory in which you wish to save the sketch
- *The Geometer's Sketchpad®* will give the sketch a name in the **Filename** text box. To use that one, click **Save**.

OR

- to give the sketch the name you wish, delete the given name, and type the name you want into the **Filename** text box. Click **Save**.

To resave a previously saved sketch:

- on the **File** menu, click **Save**.



## Closing a Sketch Without Exiting *The Geometer's Sketchpad®*

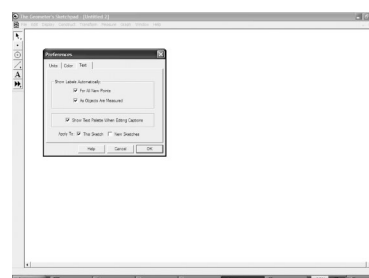
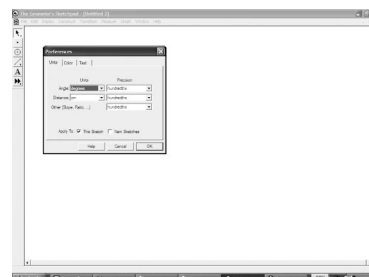
- On the **File** menu, click **Close**.

## Exiting *The Geometer's Sketchpad®*

- On the **File** menu, click **Quit**.

## Setting Preferences

- On the **Display** menu, click **Preferences...**
- Click the **Units** tab.
- Select the desired units and precision for **Angle**, **Distance**, and **Other**.
- If you select **Show Labels Automatically/For All New Points**, *The Geometer's Sketchpad®* will automatically label points as you create them.
- If you select **Show Labels Automatically/As Objects Are Measured**, *The Geometer's Sketchpad®* will automatically label measurements you define.



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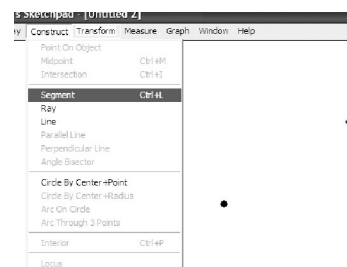
By clicking the appropriate box(es) next to **Apply To:**, you can also choose whether your selected preferences for **Units/Text** will apply to only this sketch, or to this sketch as well as all new sketches.

## Selecting Points and Segments

- Click the **Selection Arrow Tool**. The mouse cursor appears as an arrow.
- Move the cursor to the point or segment you wish to select. When the cursor becomes a horizontal arrow, click the point, and it will be selected.
- To select more than one point or segment, repeat the above step for each item.

## Deselecting

- To deselect a single point or segment, move the cursor to the point or segment you wish to deselect. When the cursor becomes a horizontal arrow, click and the point or object will be deselected.
- To deselect all selected items, click any white space.

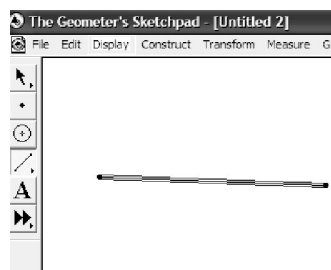


## Constructing Line Segments

- Click the **Point Tool**, and create two points in the workspace.
- Click the **Selection Arrow Tool**, and select both points.
- On the **Construct** menu, click **Line Segment**.

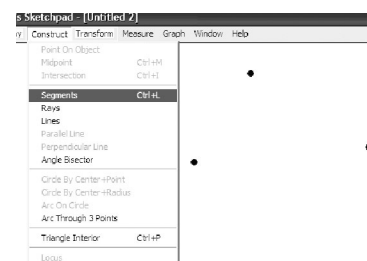
OR

- Click the **Straightedge Tool**.
- Move the cursor to the workspace.
- Click and hold the left mouse button.
- Drag the cursor to form the segment.
- Release the mouse button.



## Constructing Triangles

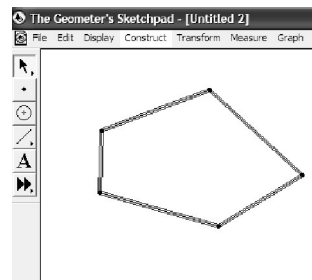
- Click the **Point Tool**, and draw three points in a triangular shape in the workspace.
- Click the **Selection Arrow Tool**, and select the three points.
- On the **Construct** menu, click **Segment**.



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## Constructing Polygons

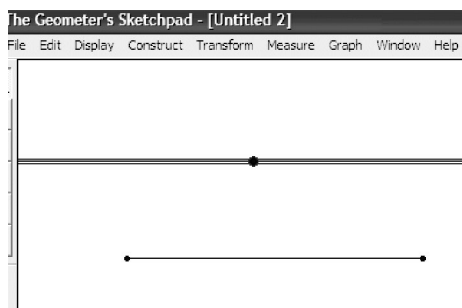
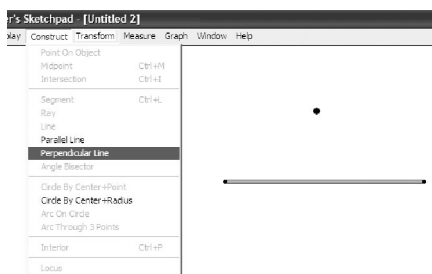
- Click the **Point Tool**. Draw four or more points in the workspace.
- Click the **Selection Arrow Tool**, and select all the points in either clockwise or counterclockwise order.
- On the **Construct** menu, click **Segment**.



## Constructing Parallel Lines

To construct a line parallel to an existing line:

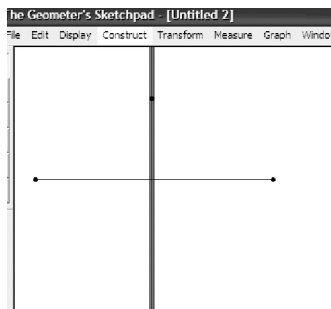
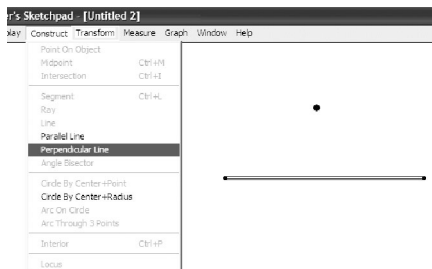
- click the **Point Tool**, and place a point above or below the existing line
- click the **Selection Arrow Tool**, and select the point and the line
- on the **Construct** menu, click **Parallel Line**.



## Constructing Perpendicular Lines

To construct a line perpendicular to an existing line:

- click the **Point Tool**, and place a point above or below the existing line
- click the **Selection Arrow Tool**, and select the point and the line
- on the **Construct** menu, click **Perpendicular Line**.

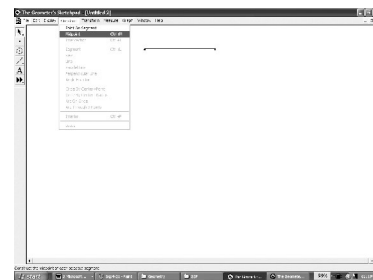


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## Constructing a Midpoint

To construct a midpoint on an existing line:

- click the **Selection Arrow Tool**, and select the line
- on the **Construct** menu, click **Midpoint**, and a point will appear on the line. That point will be fixed at the middle of the line.

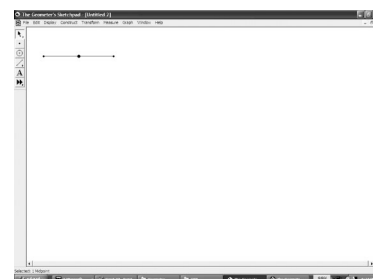


## Finding Measures

For all measures, *The Geometer's Sketchpad*® will display the desired measure using the units and precision selected in **Preferences...** on the **Edit** menu.

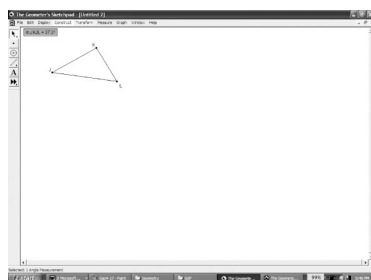
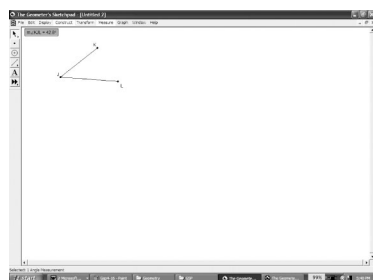
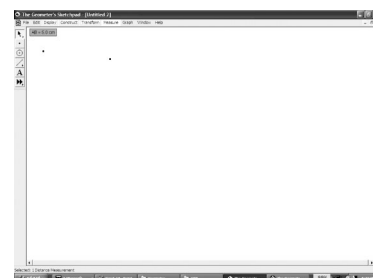
To measure the distance between two points:

- ensure nothing is selected
- select the two points
- on the **Measure** menu, click **Distance**.



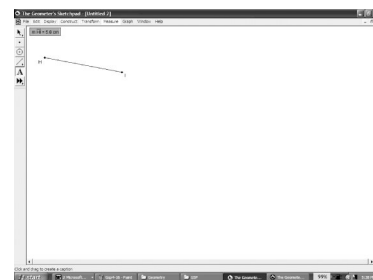
To measure the length of a line segment:

- ensure nothing is selected
- select the two points
- on the **Measure** menu, click **Length**.



To measure an angle:

- ensure nothing is selected
- select the three points that form the angle. Make sure that the second point selected is the vertex of the angle.
- on the **Measure** menu, click **Angle**.



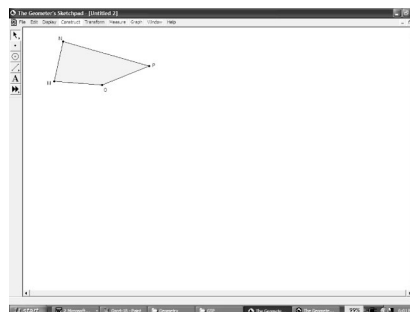
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## Constructing and Measuring Polygon Interiors

The Geometer's Sketchpad® will measure the perimeter and area of a polygon. However, you must construct the interior of the polygon first.

To construct the interior:

- select all the points representing the vertices of the polygon. Here we have a quadrilateral, so four points were selected
- on the **Construct** menu, click **Quadrilateral Interior**.  
The Geometer's Sketchpad® will call the polygon by its correct name up to five sides, after which it will use **Polygon Interior** in the **Construct** menu.



To measure the perimeter and area:

- click the polygon's interior
- on the **Measure** menu, click **Perimeter**
- click the polygon's interior
- on the **Measure** menu, click **Area**.

