THE GEOMETER'S SKETCHPAD® Version 5

New Features in Version 5 of The Geometer's Sketchpad

There seems to be a generalization that you can make about the version five (the newest version) of The Geometer's Sketchpad. This version, which was released on November 13th of this year, is cleaner, easier, and faster than any other version.

I. APPEARANCE

A change in appearance will be noticed as soon as you open the newest Sketchpad. The toolbars on the left and top of the screen have added features, and the display of points and lines have become much more aesthetically pleasing. The adjustable weights of lines, improved symbolic representations, and italicized labels and measurements have all helped Sketchpad become more user-friendly. The change in line styles and labels has made the newest version of Sketchpad comparable to SMART Technologies' Notebook Software for their interactive whiteboard.

Toolbars

The toolbars on the top and left side of version five have added some features that make the newest Sketchpad easier and quicker than past versions. The toolbar on the left side of the screen has increased in size, increasing from 6 to 9 tools.
These three new tools include the polygon tool, marker tool, and information tool.

Polygon Tool

This tool can be selected by clicking on the icon with a pentagon on it. Next, click on the canvas and a point will be placed. Keep clicking in places where you would like to a have a vertex for your polygon. After you have the desired number of sides and vertexes, click twice on your last vertex and Sketchpad will close the polygon and color the interior. This is a handy and easily accessible tool that makes the fifth version of The Geometer's Sketchpad a bit quicker and easier.
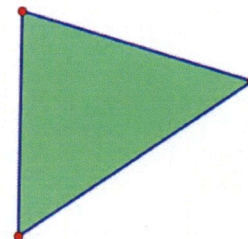
The Marker Tool

As mentioned earlier, version five has a whiteboard-type feel to it. Not only does the appearance resemble an interactive whiteboard, but it also has a new Marker Tool that facilitates the use of these whiteboards.

Uses of the Marker Tool:
- Mark angles, congruency, and parallelism
- Circle objects or write notes on the sketch

Congruency Marks

The Marker Tool allows teachers and presenters to mark angles and congruency with a simple click. To make congruency marks on a segment click on the Marker Tool icon shown above. Next, point the marker on the object you would like to
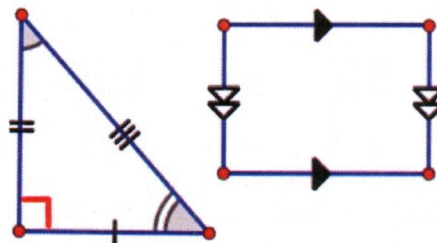
mark. By clicking once you will leave a single mark on the segment. You may click multiple times to leave multiple congruency marks.

The default settings for this version will automatically mark your objects with a crossbar. If you would like to change your marks to another display, such as the arrows shown on the previous page, you must first mark the desired object then right-click on the mark. A menu will appear, as shown to the left, and you will have several options at the bottom of the menu.
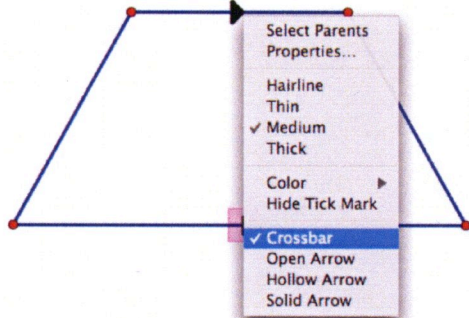
Congruency options include:
- Crossbar
- Open arrow in both directions
- Hollow arrow in both directions
- Solid arrow in both directions

Angle Marks

Marking an angle with this tool is similar to marking congruency. To mark an angle select the marker tool and click on the point where two objects intersect and drag the mouse towards the interior of the angle. To ensure that you mark an angle, be sure to hold down on the mouse while you drag inwards. If the angle being marked exactly ninety degrees, such as a perpendicular bisector, then the angle mark will automatically adjust to show that it is a right angle.
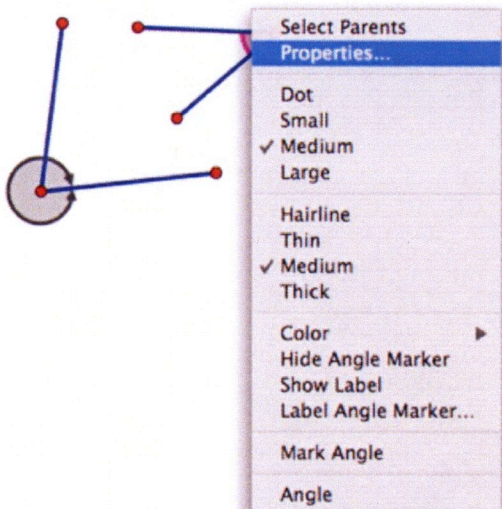
Like the congruency marks, the default settings for this version will automatically mark your objects with a normal angle mark. If you would like to change the display of your marks to show the direction of the angle you can use a similar process as before. First select the mark (the desired mark should highlight in another color), then right click. A menu will appear. Select "Properties". Next select "Marker" and there will be a list of four different angle definitions:

- Simple angle
- Reflex angle
- Counterclockwise
- Clockwise
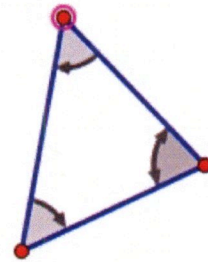
To mark angles with arrows, select the Marker Tool and click on one segment or ray of the angle. While holding down the left-click drag to the other segment or ray. An angle mark will appear with an arrow in that direction.

Unfortunately, Sketchpad sets a limit of four strokes (or marker lines) per object. When marking non-angle objects you can work around this limitation by marking the object at another place. Markings can also be edited by selecting a mark and choosing Edit | Properties | Marker.

Information Tool

The last addition to the toolbar is the information tool. This tool is used to describe the relationship between elements on Sketchpad.

$m\angle BDC = 55.60°$
$m\angle BDA = 27.80°$
$m\angle ADC = 27.80°$

Ray *m* bisects angle *B-D-C*.
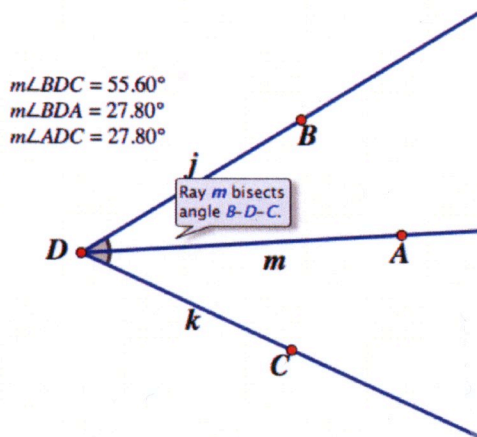
To use the information tool, simply select the icon shown above and click on the object you wish to inquire. A speech bubble pointing to the chosen object will appear with the object's relationship. When there are many lines and objects on a sketch, this can be especially useful because it can remind the user what the object's purpose is without causing confusion. A screen shot from The Geometer's Sketchpad is shown to the left.
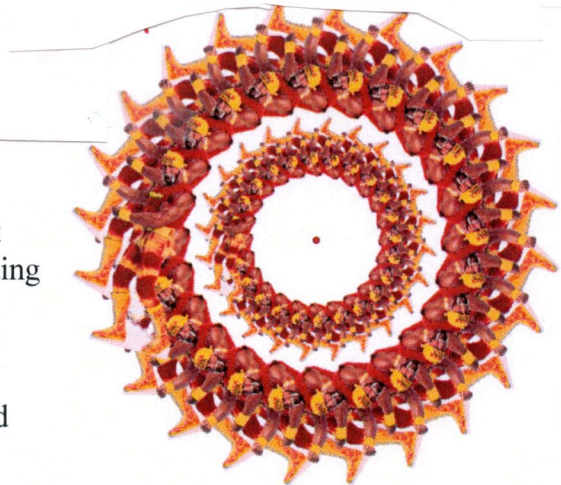
II. COMPETING WITH GEOGEBRA?

Transformable Pictures

A feature that's new to The Geometer's Sketchpad (but not to another familiar program) is the option of importing pictures. Older versions of Sketchpad allowed you to import or paste digital images into the sketch, but you could not transform these pictures in any way. Now, pictures can be imported from a digital camera, dragged from another source, or pasted onto the sketch. These pictures can then be rotated, dilated, translated, and reflected like other geometric objects.

$m\angle ABC = 322.86°$
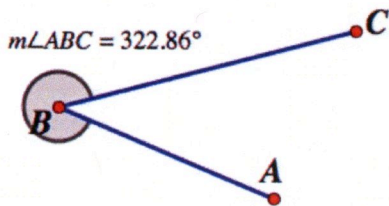
To do this, select the picture and an object to rotate, dilate, or reflect about. Then select "Transform" from the top toolbar and several transformations

Angle Capabilities

Geometer's Sketchpad 5 also has more capabilities concerning angle measure. It is easy to mark a reflex angle using the Marker Tool (click and drag outward instead of inwards). To measure this angle, right click on the angle mark and select "Angle" at the bottom of the menu. The angle measure and label will appear at the top of the document.

In older versions angles were defined and measured by selecting three points in a specific order. Now an angle can be chosen by selecting two intersecting rays or segments. This can be useful when a class is discussing the definition of an angle.

III. HOT TEXT

The Hot Text feature is another great addition to The Geometer's Sketchpad. For presenters and teachers who wish to avoid confusion when talking about a sketch, this feature specifies the object by linking the object to the corresponding caption.
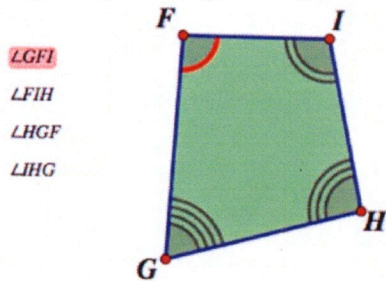
To insert this feature into your presentation or lesson, you must have a caption open with your object. Captions are created by using the text tool **A**. With the caption open, click on the object you would like to insert into the caption. The object will then appear in the caption.

Points, lines, polygons, and angles are all examples of objects that can be used with the Hot Text feature. When using an angle with Hot Text it is important to have the angle marked beforehand.
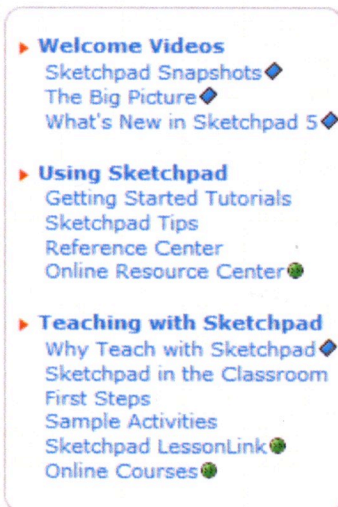
Now that you have the objects linked to Hot Text, mouse over the caption and the corresponding object will be highlighted. In the picture above, the mouse was over angle GFI. As seen in the picture, the corresponding label is highlighted in red. If the user clicks and holds the mouse over the caption, the object will remain blinking until the user unclicks the mouse.
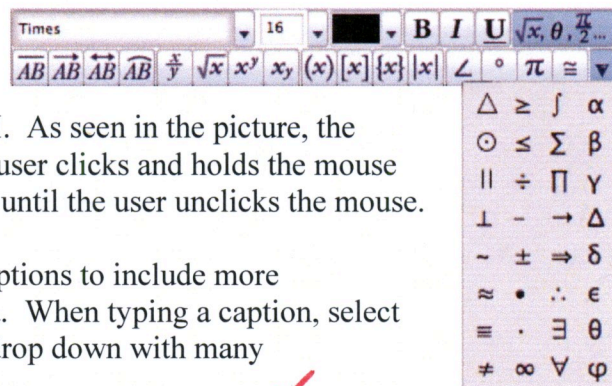
The Geometer's Sketchpad has also modified captions to include more mathematical expressions, including pi and theta. When typing a caption, select the option with pi and theta on it. A menu will drop down with many mathematical symbols and expressions.

IV. THE LEARNING CENTER

The Learning Center is a new resource that has been incorporated directly into Geometer's new Sketchpad 5. The Learning Center can be accessed simply by selecting the "Help" menu located at the far left of the menu bar.
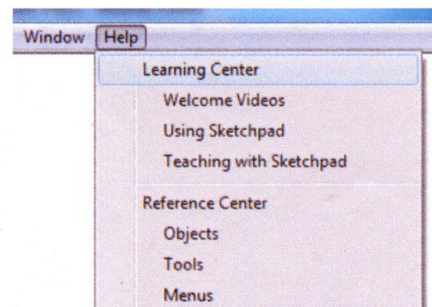
The Learning Center provides the user with multiple links to very useful resources that are great for anyone new to Sketchpad, especially teachers. From this main menu, users can access multiple different resources to aid with both instruction and understanding of Sketchpad 5.

The user can view helpful videos on nearly every page of the Learning Center. Videos are marked with   .

In addition to all of the information within the learning center, there are also links to online resources as well. These links are marked with   .
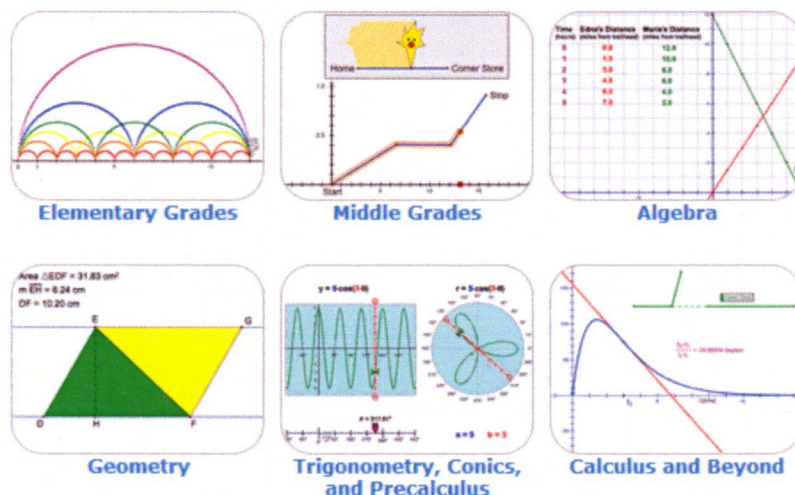
Resources for Teachers

As stated previously, Sketchpad has many resources for teachers. Specifically we will examine "First Steps" and "Sample Activities."

First Steps addresses the issue of how to initially introduce students to Sketchpad, from learning the basics to step-by-step tutorials. It also covers and handful of common concerns, for example:

- Do I need a computer lab to use Sketchpad with my students?
- Can I use sketchpad to make tests and worksheets, or to publish my work?
- Is there any research about the effect Sketchpad has on student learning?

Introducing Sketchpad to teachers is probably harder than introducing it to students. But with the available resources in the integrated Learning Center, it can be picked up very quickly.

Sample Activities provides teachers with quite a few activities for all grade levels, covering multiple different skill levels with the software.

Elementary Grades   **Middle Grades**   **Algebra**

Geometry   **Trigonometry, Conics, and Precalculus**   **Calculus and Beyond**

To find a level or subject area, simply click on the corresponding link on the "Sample Activities" page.

In this case, we choose "Algebra." Specifically, we chose an activity relating to Algebra tiles.

Tiling in a Frame: Multiplying Polynomials

Students use Sketchpad algebra tiles to multiply polynomials. Using the polynomial factors as dimensions, they build rectangles out of tiles. The area of the completed rectangle represents the product.

View Overview 📄 | Download Activity Files (.zip)

To download and use the activities, you need simply to select the download text underneath the description and follow the prompts. Once saved, the file can be opened directly with Sketchpad 5.

V. PRICING AND PURCHASING

The Geometer's Sketchpad has features that make teaching and presenting Geometry much easier for everyone. To use Sketchpad, a license must be purchased. After the license is purchased, it can be downloaded onto a Macintosh or Windows computer and all of the features will be unlocked. Many people already know that Geogebra comes free of charge. What about the newest version of The Geometer's Sketchpad? A rundown of the pricing plans is shown below:

- Single-User License: $69.95
- School/Institution License:
    - 1-4 computers: $69.95 per computer
    - 5-19 computers: $30 per computer
    - 20-49 computers: $25 per computer
    - 50-99 computers: $20 per computer
    - 100+ computers: $15 per computer
- Multi-Student Home-Use License:
    - 1-29 students: $29.95 per student
    - 30-99 students: $20 per student
    - 100+ students: $15 per student
- School License Value Packs:
    - 5-Computer School/Institution License: $150
    - 20-Computer School/Institution License: $500
    - 50-Computer School/Institution License: $1000
    - 100-Computer School/Institution License: $1500
    - 30-Student Home-Use License: $600
    - 100-Student Home-Use License: $1500
- Single-Student Home-Use License: $29.95