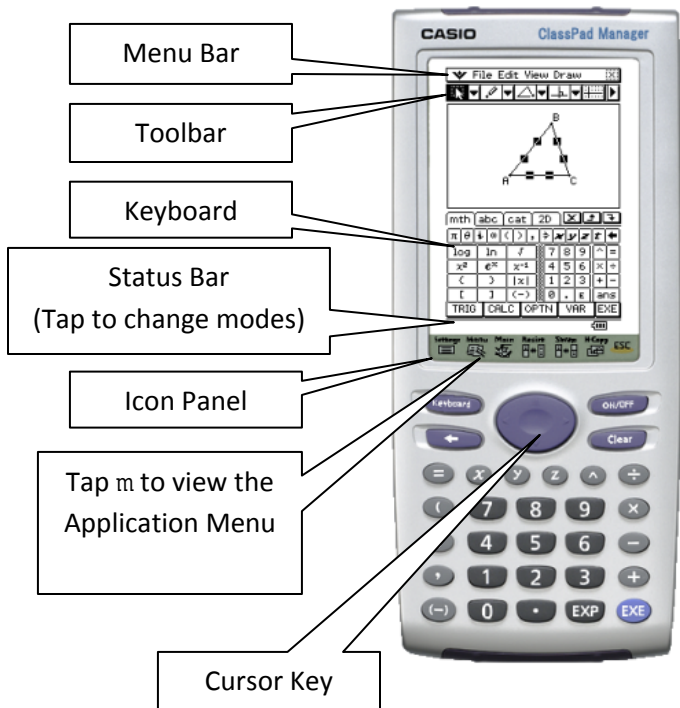


Geometry on the ClassPad

Useful Vocabulary



Entering Math

Tap the G key on the Icon Panel.



The Keyboard button turns the soft keyboard on and off.

Tap each of the tabs at the top of the Keyboard to explore what lies in each one.

Also, try tapping on the tabs at the bottom of the Keyboard to explore those as well.

Radians and Degrees

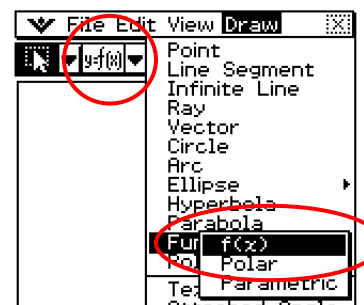
The ClassPad has angle unit settings for radians and degrees. While in J you can see which mode you are in on the bottom of the screen. You can quickly change modes by tapping it with the stylus.



While in G you can change this by going to O in the upper left of the menu bar and select **Basic Format** or **Geometry Format** to change the angle modes.

Graphing Functions

To graph a function in the Geometry application, select **Draw, Function** and choose your function type from there. An alternative is to use the dropdown toolbar button ({}) that is second from the left. For this example, choose **f(x)**.

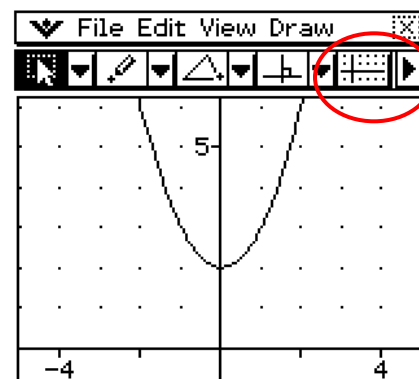


Use the soft k to enter your desired function. In this case, enter x^2+2 and tap **OK**.

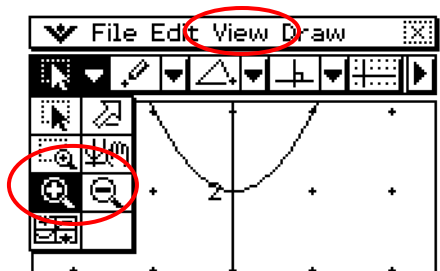


You should get a graph that looks similar to the one below. To turn on the axes, tick marks, and integer grid, select the (q) toolbar button or go to O and select **Geometry Format**.

If you select the toolbar button, tapping once will turn on the axes, tapping twice will add the tick marks, and three times will add the integer grid.



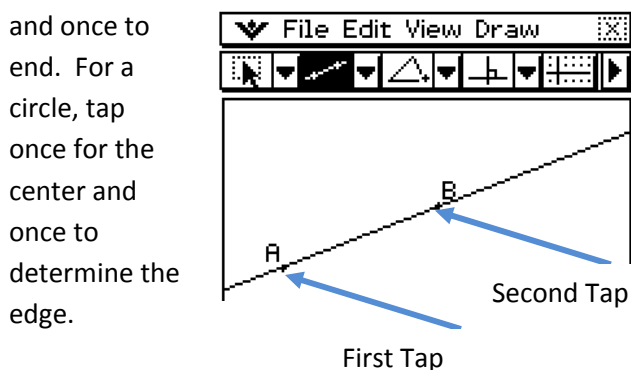
To zoom in and out, you can use the addition/subtraction keys, or the toolbar buttons \mathbb{W}



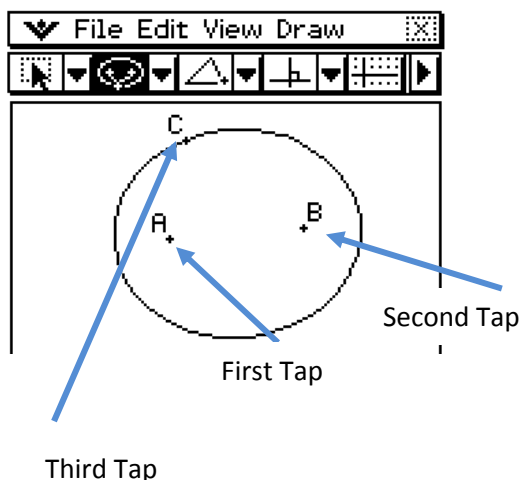
and \mathbb{E} . The **View** menu also has some zoom options. Try zooming in and out using whatever method you prefer.

Drawing Objects

To draw objects, use the second dropdown toolbar from the left or use the **Draw** menu. Experiment with drawing different figures. For points, tap once. For lines, line segments, rays, and vectors, tap once to start

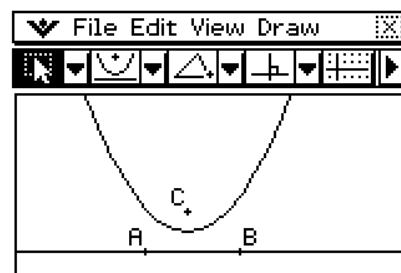


and once to end. For a circle, tap once for the center and once to determine the edge.



For a hyperbola, use the same idea as for an ellipse. Tap once for the first focus, once for the second focus, and a third time to determine the hyperbola.

For a parabola, tap once to start the directrix, a second time to determine the direction of the directrix, and a third time for the focus.

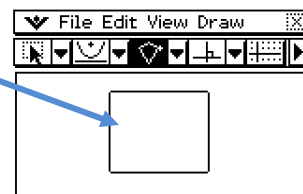


For the polygon tool (0), each tap will create a new vertex. To close your polygon, tap back on the first point you created.

Drawing Special Shapes

To draw special shapes, use the third dropdown toolbar from the left or use the **Draw, Special Shape** menu. Experiment with drawing different figures. You can tap once after selecting your desired shape. In this case, you will get a shape that fills the screen.

If you want to determine the size, press and drag to determine the size of the boundary box. When you are satisfied, release. Your figure will draw.

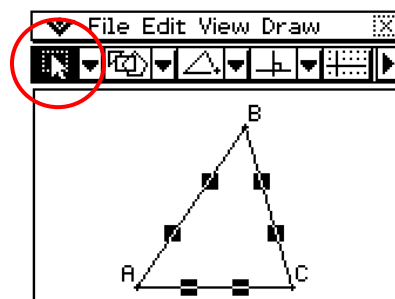


For a regular n-gon (i), you will be prompted to enter the number of sides you want. Once you tap **OK**, you can follow the same rules as with other special shapes.

Drag and Drop






To drag and drop something we first need to select it. Once you've created your figure, you must select the figure in order to move it.

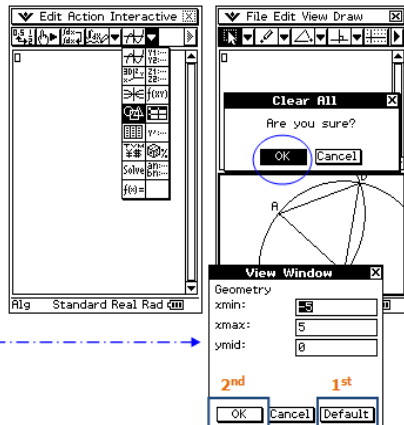
With the select tool (G) chosen, tap each side of the figure you want to move so it's selected (this is shown by the black boxes on each segment).



Tap and hold one of the selected segments, drag to where you want it, then release.

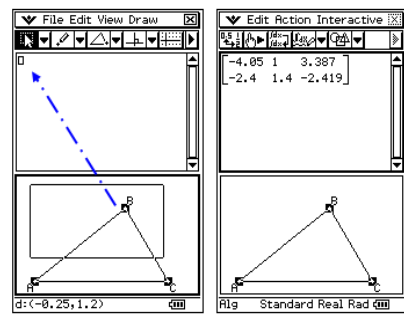
1. Opening a Geometry Window within the Main Window

- Tap  on the icon panel
- Open Main ()
- Clear your window
- Tap the 2nd  button
- Select  (Sweet!)
- Tap inside your Geometry window and select Edit/Clear All
- Select  and then **View Window**
- Tap **Default** and then **OK**



2. Dragging a Triangle to Main

- Tap inside Geometry (its border looks bolder)
- Draw a triangle
- Select each vertex point (A, B and C)
- Press near one of the selection boxes and drag to the small box (□) in Main
- Release when you see the cursor blink in Main's □ (the little box)



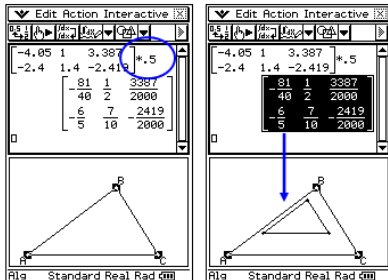
Important

(Notice that Main's border is now the bolder one **AND** the toolbar changed)

When you click in a window, its border becomes bolder and the toolbar buttons change. The border and toolbar let you know which application you are in so that you can focus on your work!


3. Dragging a Triangle back to Geometry

- Tap following the matrix
- Input $\times .5$ and press EXE
- Tap on the result to select it
- Press on selection and drag back to Geometry
- Isn't this great!
- Check the area of each triangle. Does this difference make sense? Hmm...




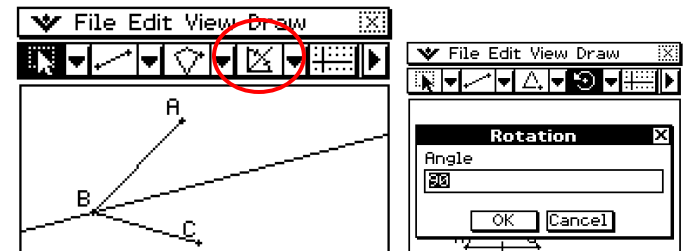
Constructions

Once nice feature of the ClassPad is that when performing constructions, if you tap without having something selected (or the proper things selected), it will tell you the proper selections in the status bar.

Need segment selected 

You can construct using the toolbar dropdown buttons that are fourth from the left. You can also use the **Draw**, **Construct** menu.

Let's try to construct an angle bisector. First, select both segments that form the angle. Then choose the command **Angle Bisector** or the toolbar button . You should get something like this:



Take a few minutes and experiment with different constructions.

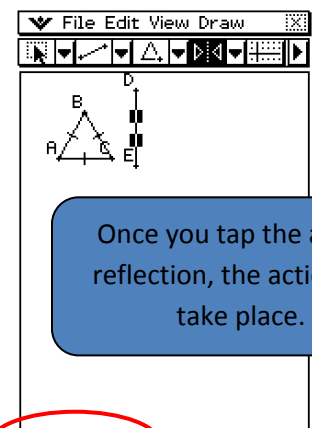
Transformations

You do not need to select the object(s) if you want to transform every object on your screen. If there are multiple objects and you do not want to transform all of them, you need to select the desired object(s) and then use the command.

Reflections

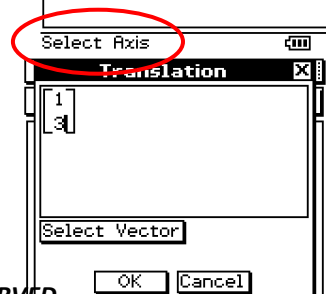
In order to reflect an object, you need to have a line or line segment drawn.

Once you select the command, you will be prompted to select the axis of reflection. Select the line/segment you drew.



Translations

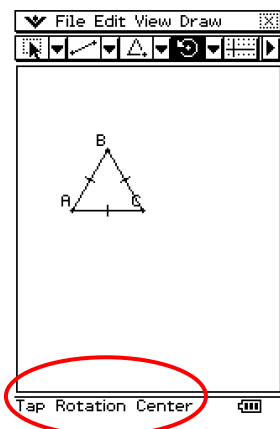
To translate an object, you can have the



translation vector drawn before using the command, or you can enter the vector coordinates in a matrix when prompted after choosing the command. If you already have the translation vector drawn, when prompted, tap **Select Vector**. If not, enter your coordinates in the matrix.

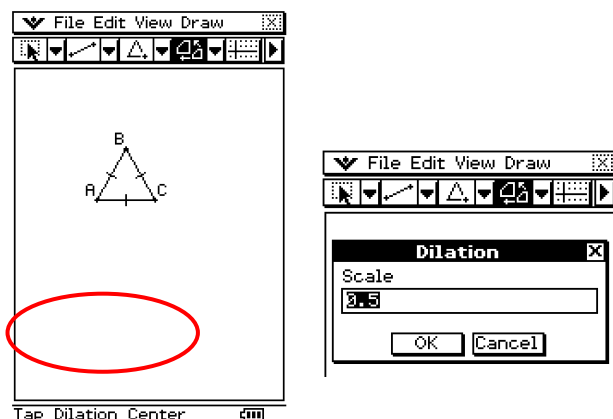
Rotations

To rotate an object, you will be prompted to tap the rotation center after selecting the command. Once you tap the center, you will be asked to enter the angle of rotation. Enter your desired angle and tap **OK**.




Dilations

To dilate an object, you will be prompted to tap the dilation center after selecting the command. Once you tap the center, you will be asked to enter the scale of dilation. Enter your desired scale and tap **OK**.

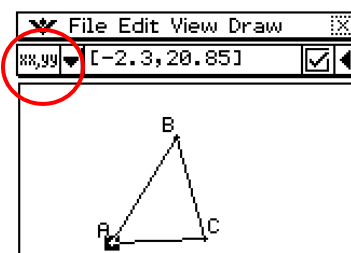


Measurements

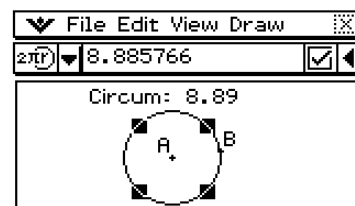
With the measurement command, you can find the measurements for angles, supplementary angles, area, circumference, coordinates, direction, equation, length, radius, and slope.

There are two ways to take measurements. Either use the **Draw, Measurement** menu, or tap on the  on the right side of the toolbar and use the dropdown toolbar buttons on the left side when you get to this window.

If you use the **Draw, Measurement** menu, it will automatically paste the measurement into the draw space. If you use the toolbar buttons, you must tap on the button to paste the measurement.



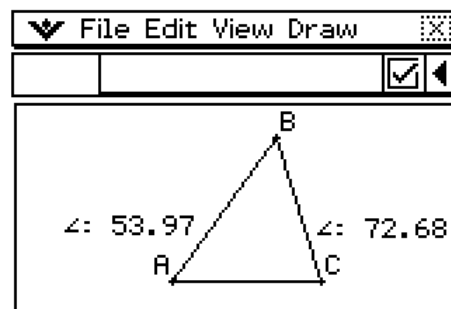
Try drawing a circle, and pasting the circumference measurement into the draw space. It should look something like this:



Calculations

Use the **Draw, Expression** menu to create a calculation based on the values you have already measured and pasted.

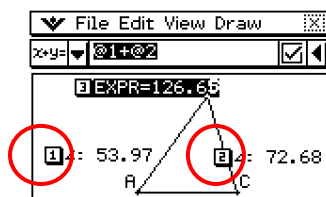
For example, to add two angles of a triangle together, you must measure and paste the two angles first. If you need help with this, see the "measurements" section above. (You can drag and drop the measurements where you want them by tapping to highlight them, and then pressing, dragging, and releasing where you like.) It should look something like this:



Now, tap **Draw, Expression**. Numbers will appear next to the measurements that are on the draw space. You can tap on those numbers to use those measurements in your calculation(s).

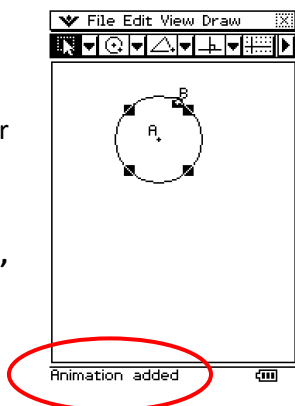
Try adding the two angle measures together. Tap on the number next to the first measurement, press the addition key, and then tap on the number next to the second measurement.

When finished press **EXE**.
It should look something like this:

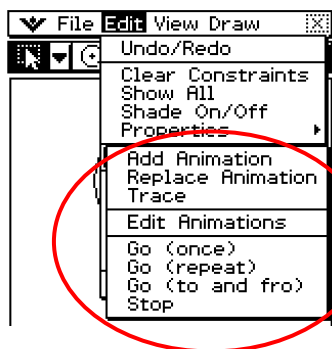


Animations

To create animations, you need a point and a curve. Let's set up a simple animation. We'll animate a point on a circle. Construct a circle; in doing so, you will already have constructed a point on that circle with your second tap. Select both the point and the circle by tapping on each. Select **Edit, Animate**. The status bar should read "**Animation Added**".



To run an animation, select **Edit, Animate**, and then choose which of the **Go** options you prefer. You can stop an animation by using the command **Stop** in this same menu, or by tapping **ESC** in the icon panel.



You can also trace an animation by using that command in the same menu.

General Quick Tips

Selections

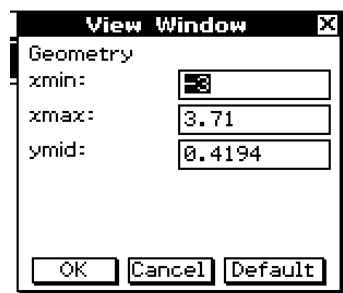
- always make sure the select tool (G) is highlighted to make selections after constructions
- to deselect any selection, tap in blank space

Zooming/Scrolling

- there is another zoom button (Q) called **Zoom Box** (create a boundary box like when creating a figure; the part selected by the boundary box will be zoomed in on)
- selecting the R button will **Zoom to Fit**
- you can scroll around the screen by using the n toolbar button and using your stylus to press and drag; release when you are satisfied with the placement

Viewing

- selecting O, **View Window** will open the following dialog box; you can always revert back to the default settings by selecting **Default**



Measurements

- if you want to constrain (lock) a measurement, select the measurement and tap the s button; if want to take it off, tap it again