

ClassPad 101

for ClassPad Version 3.00+

LESSON 3

Introduction to Geometry

Welcome

In this lesson, we will have fun working inside the Geometry application. Geometry is one of my favorite applications because there is so much we can do. We will visit Geometry many times during this course. For now, try to get used to which mode you are in by watching the buttons.

[Very Helpful Feature] Did you know that you can right click on your ClassPad Manager and check "Always on top"? This will keep the ClassPad on top of the other files you have open.


Lesson Goals

- To become comfortable drawing figures
- To become comfortable resizing figures
- To understand the meaning of Analytic Geometry

In Lesson 3, you will learn how to:

- Draw figures
- Select and deselect figures
- Find figure measurements
- Insert a Geometry window into the Main application
- Drag and drop between Geometry and Main

Upon completion of this lesson, you will be able to answer the following questions:

1. How do we draw a circle?
2. What happens to the toolbar when we select a figure from the Draw menu?
3. How many drawing button palettes does Geometry have?
4. How do you get to the Measurement Box in Geometry?
5. What does it mean when the  button is highlighted?
6. What happens when you drag a line segment to the Main application?
7. What is Analytic Geometry?
8. Who discovered Analytic Geometry?

Time required

About 70 minutes.

Getting Started

Most of this lesson will be hands on. As you work through an example, think about other buttons that you want to try and just try them. Experiment, explore and have fun! If you get an error dialog box, click OK and continue.

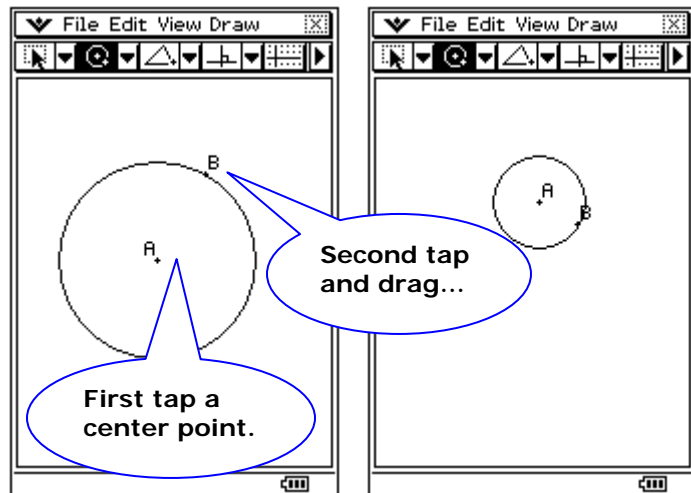
PART I

In this part, we will practice drawing figures. Here are a few helpful hints:

- **[Important]** You are in a *Drawing mode* when a toolbar drawing button is *highlighted*.
- **[Very Important]** If you do the wrong thing (which is easy to do), **select Edit/Undo-Redo immediately**. Undo-Redo will undo the very last thing you did, or redo it if selected twice.

1. Drawing a Circle

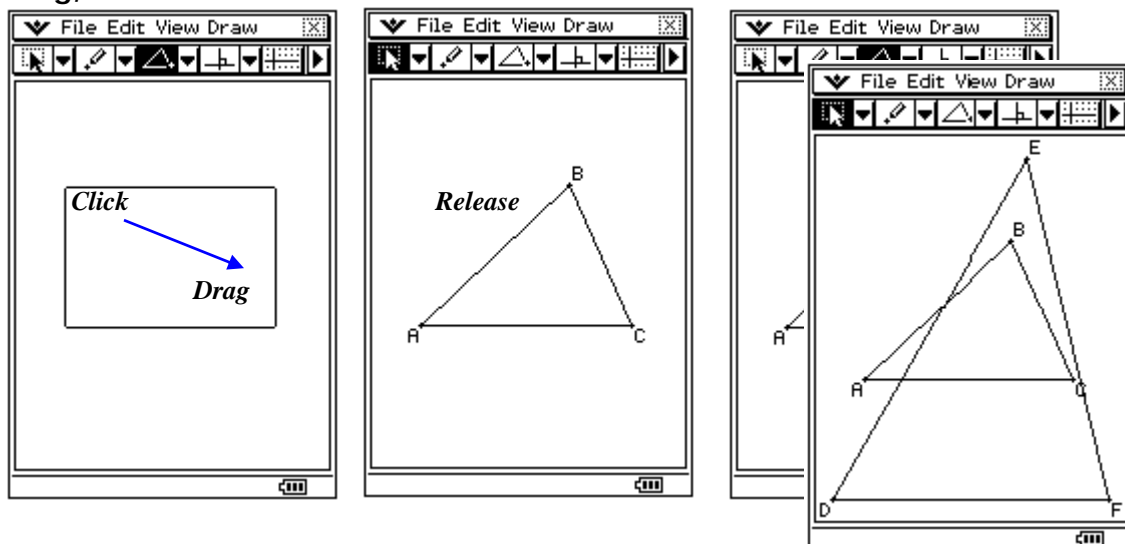
- Click **m** and then **G**
- Clear your window (select **Edit/Clear All**)
- Open the **Draw** menu and select **Circle**
- Notice the Circle button is highlighted
- Draw a medium circle
- Open the **Edit** menu and select **Undo-Redo**
- Draw a smaller circle
- Edit/Undo-Redo** again!



2. Drawing a Triangle

With the triangle button selected, click, drag, and then release.

Or, just click once for the default size.

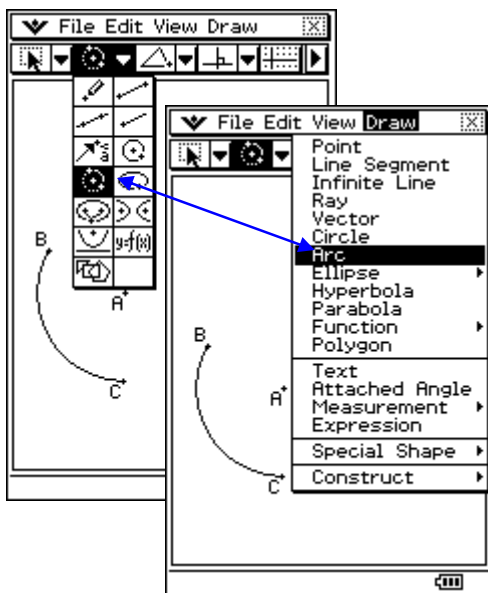


3. Drawing “other” Figures

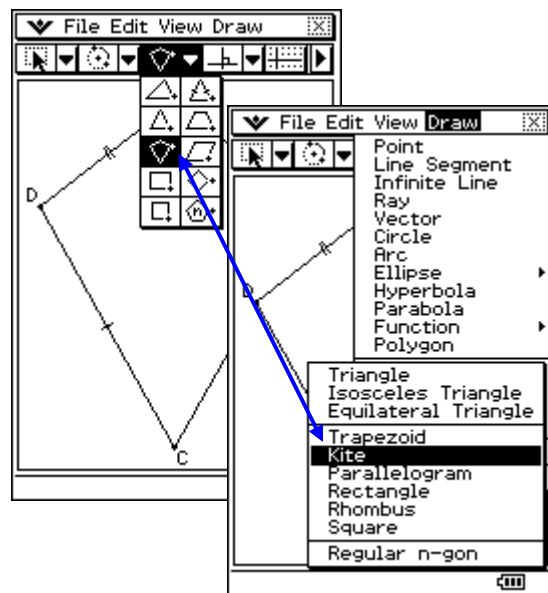
The ClassPad has two different dropdown button palettes for drawing. One is for drawing general shapes and the other draws special shapes such as an equilateral triangle. 😊 **Please** think about the following as you experiment with drawing:

- You change modes by selecting a different toolbar button or selecting an item from the draw menu.
- When you select items from a menu, the toolbar changes automatically to show your selection as highlighted.
- Pay close attention to which toolbar button is selected!

General Drawing Palette

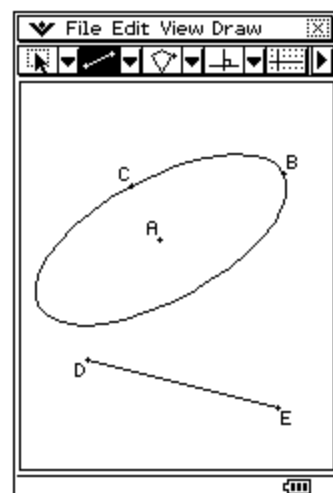
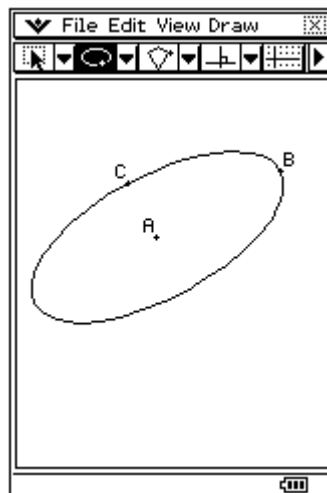


Special Shapes Drawing Palette



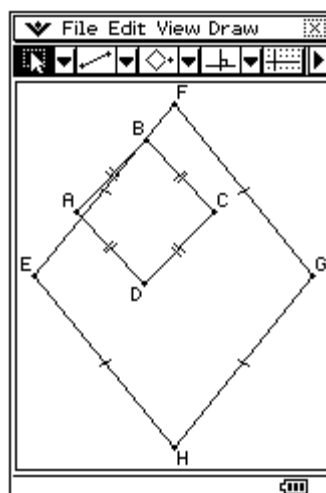
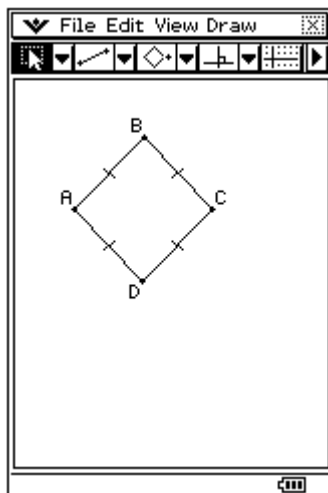
4. Drawing “general” Figures

- Clear your window
- Open the **Draw** menu and select **Ellipse/Axes**
- Draw an ellipse (You click three times a,b,c)
- Select the 2nd π on the toolbar and select γ
- Draw a line segment (You click two times; start and end)
- Clear your window
- Try drawing other figures using the draw menu and button palettes



5. Drawing “special” Figures


- Clear your window
- Open the **Draw** menu, select **Special Shape/Rhombus**
- Draw a rhombus (press, drag and release)
- Click the rhombus button on the toolbar
- Click anywhere in the window's work area
- Try drawing other special shapes



PART I



Practice Exercises

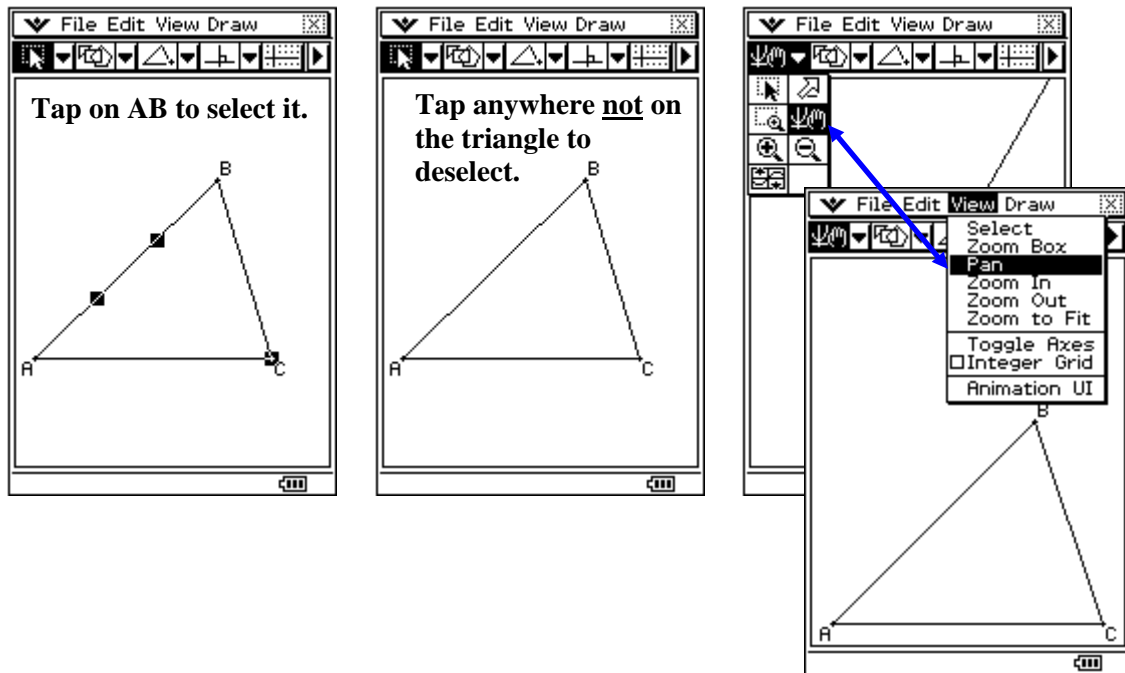
Before beginning the practice exercises, open a word document, type in the following information and then *save it as Lesson3 in your CASIO folder within My Documents*:

- Date: (enter today's date)
 - To: (put your instructor's name here)
 - From: (put your name here)
 - Re: Lesson 3
1. Please open the Geometry application and clear the window.
 2. Draw a regular polygon with 5 sides. Hint: Look in the Special Shape sub-menu.
 3. Draw another regular polygon with 6 sides. Hint: Just click its toolbar button.
 4. Get a **screen capture** and paste it into your Lesson3 document (under a title of PART I).
 5. Please clear your window. Draw an ellipse using foci and a vector in the same window.
 6. Get a **screen capture**. Add two blank spaces following the first screen capture and then paste this one.
 7. Please clear your window again. Draw an **interesting figure** using the Polygon () draw button. With this button, your **start and end points must be the same**; but you can go anywhere in between.
 8. Get a **screen capture** of your interesting figure. Add two blank spaces following the second screen capture and paste this one. Thank you.

PART II


In this part, we will practice selecting, deselecting, resizing and measuring figures. **Please** think about the following as you experiment:

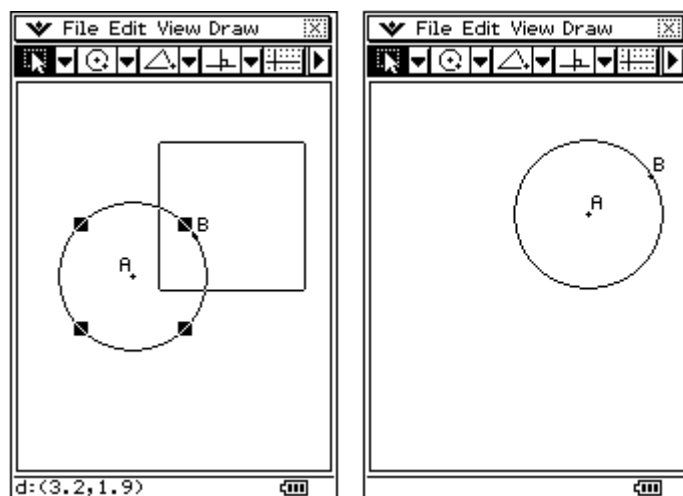
- You are in the **Selection mode** when  is highlighted (.
- The other buttons in the drop down palette have the same functionality as the items in the **View** menu.



1. Selecting, Moving and Deselecting


Sometimes I forget to change to the selection mode and draw an unexpected figure. This is when I find **Edit/Undo-Redo** helpful!

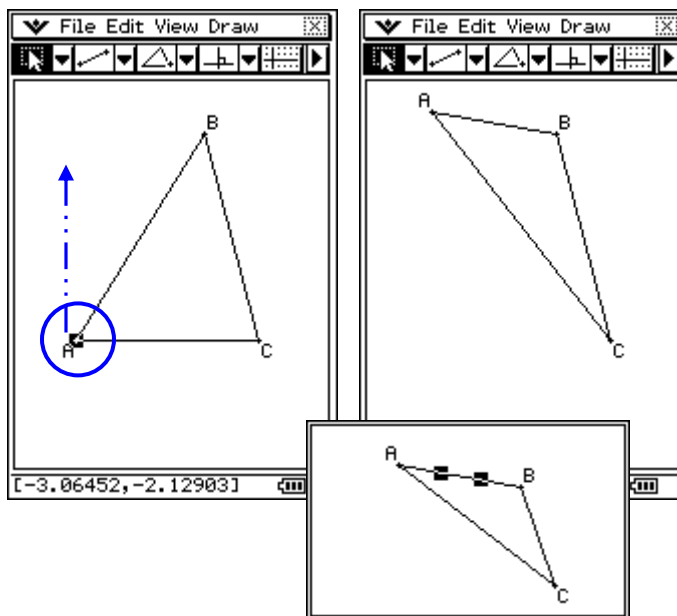
- Clear your window
- Draw a circle
- Click  to change to **select mode**
- Click on the circle to select it
- Press near one of the selection boxes (black boxes) and then drag and release
- Click in **any white space** to **deselect**



2. Resizing a Figure

You can resize a figure by selecting just part of the figure, pressing near a selection handle and dragging.

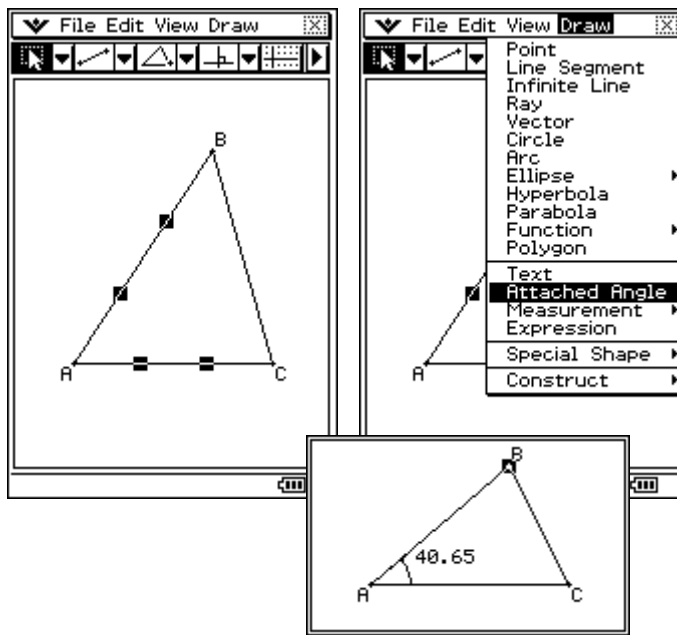
- Clear your window and draw a triangle
- Click  to change to select mode
- Click on vertex **A**
- Press on the selection box (black box) and drag
- Click in any white space to deselect
- Try selecting side AB and dragging it



3. Measuring Angles

You can add an attached angle measure that updates as you modify the triangle.

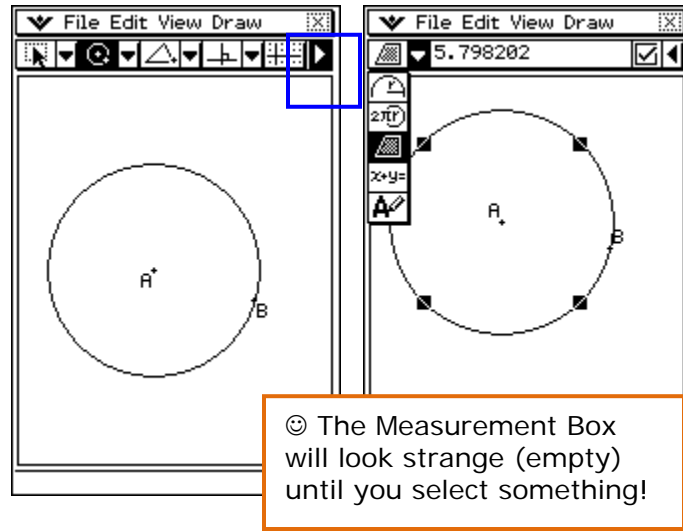
- Clear your window
- Draw a triangle
- Select two sides**
- Open the **Draw menu** and select **Attached Angle**
- Wow! 😊
- Deselect everything
- Select only vertex **B**
- Press on vertex **B** and **drag**
- Notice the attached angle updates



4. Using the Measurement Box to Measure Figures

The Measurement Box is very intelligent. It knows what you have selected and provides a list of all measures that it can think of related to your selection. What can the Measurement Box tell us about a circle?

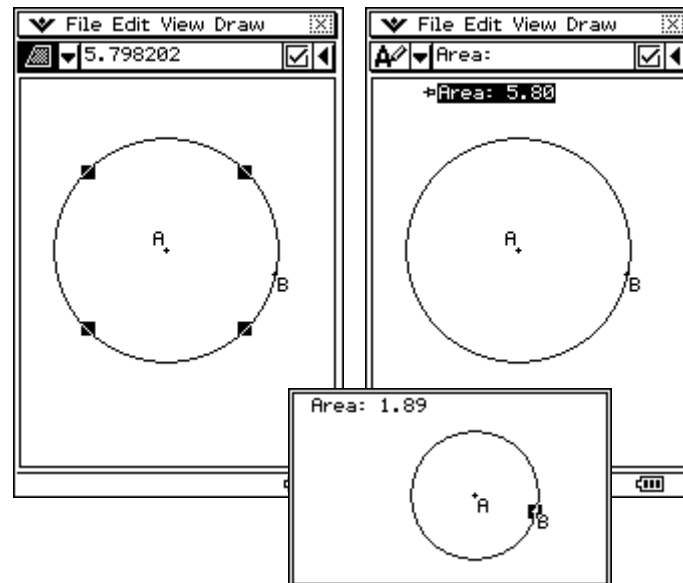
- Clear your window
- Draw a circle
- Click the far right \cup
- The **Measurement Box** appears ☺ and you automatically change to select mode
- Select your circle
- Click the only \cap
- Select E for area
- The area of your circle shows in the box



5. Adding a Measure to the Window


You can display measures from the Measurement Box on the window. Simply click the top measurement button, or select Draw / Measurement / any measure. We will learn more about this in Lesson 9. For now, please try this example:

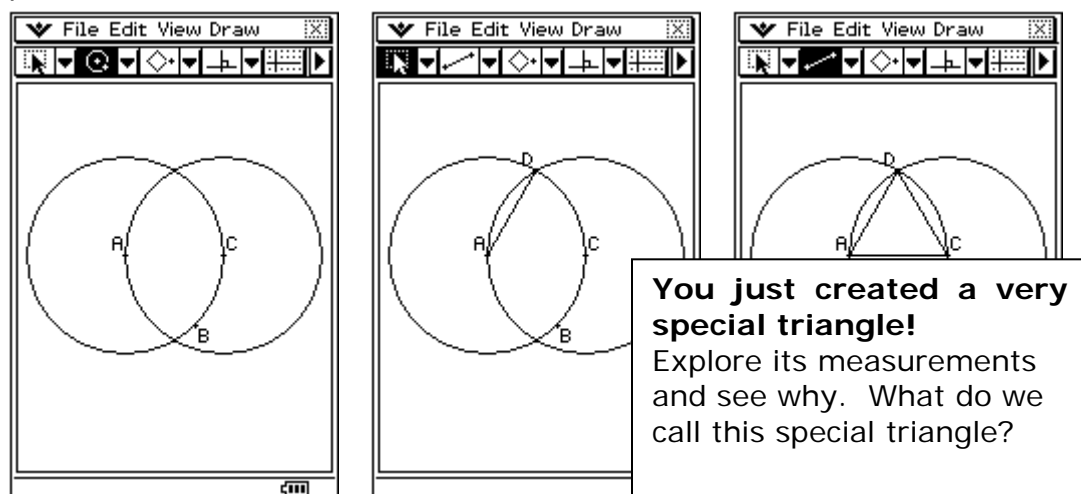
- Do not clear** the window!
- Select your circle
- Now, just click the E button
- The area of your circle shows in your window
- You could rename Area if you wanted to
- Select just point **B**
- Drag it in to make your circle smaller
- You can also change the area by typing directly into the Measurement Box



PART II

Practice Exercises


1. Please start with a clean Geometry window. Are you ready?
2. Draw a vector and then select it.
3. Copy and then paste the vector (see HELP). Move the pasted vector (named s) away from the first vector (named r).
[HELP: On your computer's keyboard, press the Ctrl key and c key to copy the vector. Next, press the Ctrl key and v key to paste the vector. Or, you can use copy and paste from within the ClassPad's Edit menu.]
4. Get a **screen capture** and paste it into your Lesson3 document (under a title of PART II).
5. Please clear your window and draw a circle.
6. Advance the toolbar so that the measurement box shows.
7. Select your circle to make the Measurement Box come to life and change it to show the circle's circumference (the $2\pi r$ button).
[Circumference is the distance around the outside of a circle. The ClassPad uses $2\pi r$ for distance around the outside of any figure.]
8. Click $2\pi r$ again to display the circumference in the window.
9. Get a **screen capture**. Add two blank spaces following the first screen capture and then paste this one.
10. Please clear your window again.
11. Draw two circles as follows: 1st draw one circle and then draw the 2nd by clicking on the 1st circle's outer edge and then the 1st circle's center (see the circles below).
12. Draw line segments to create the triangle shown in the last figure below.
13. Select two sides (you can drag to select) and click .
14. Get a **screen capture** while the angle is showing in the Measurement Box. Add two blank spaces following the second screen capture and then paste this one.

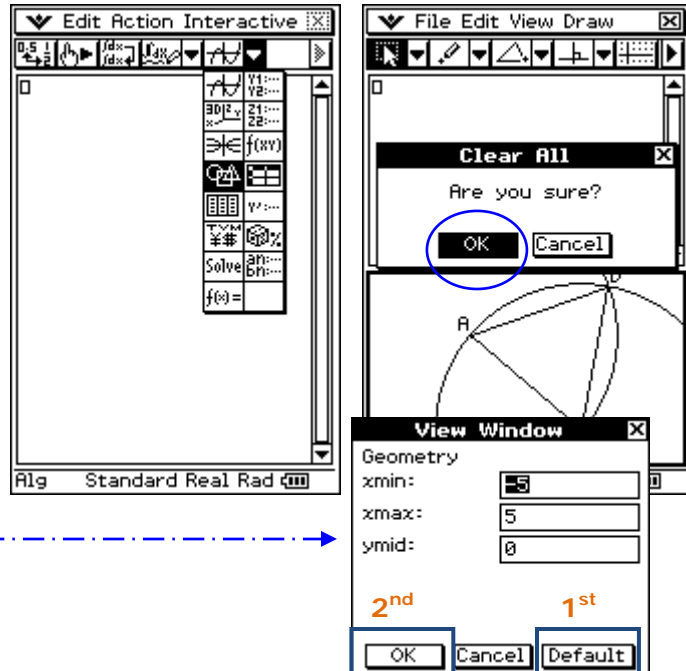


PART III

This is the most exciting part! You will be amazed by what you can do.

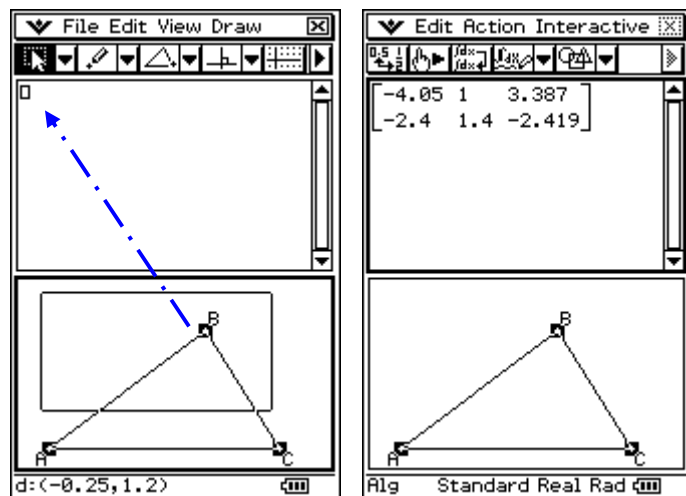
1. Opening a Geometry Window within the Main Window

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



2. Dragging a Triangle to Main

- Click 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)



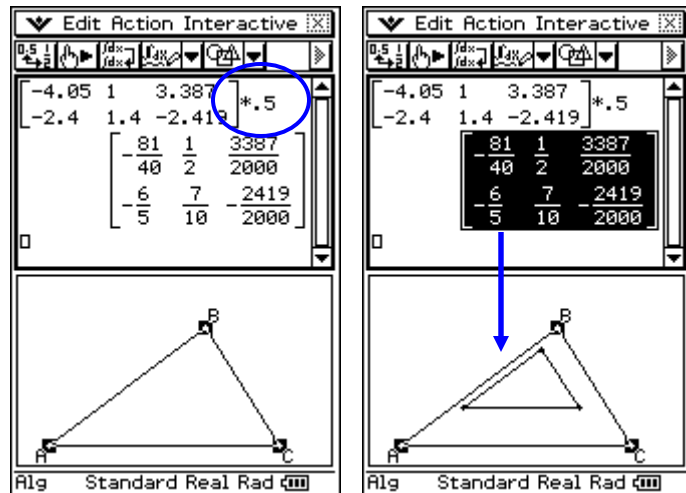
Important

(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

- Click following the matrix
- Input $\times .5$ and press E
- Click 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...




What you just did can be thought of as Analytic Geometry!



Rene Descartes (1596-1650) developed a new branch of mathematics for everyone to enjoy called *Analytic Geometry*. Analytic Geometry can be thought of as a branch of mathematics that brings together algebra and geometry in a very beautiful way. It allows us to visualize numbers as points on a graph, equations as geometric figures and geometric figures in an algebraic form. Rene Descartes would have loved the ClassPad! If only we had the ClassPad 400 years ago.

PART III

Practice Exercises

- Open the Main application and clear its window.
- Insert a Geometry window and clear its window.
- Click inside the Geometry window and then click  three times.
- Draw an infinite line (look in the draw menu).
- Select your line (not the points) and release.
- Press near a selection handle and drag it to the Main window. Wow, the equation shows!
- Get a **screen capture** and paste it into your Lesson3 document (under a title of PART III).
- In Main, press EXE. On the next line, type in: $2x + 3y = 1$ and press EXE or Enter. Select the result and drag it to the Geometry window. Did a line draw?
- Get a **screen capture**. Add two blank spaces following the first screen capture and paste this one.
- In Main, type in $y = x^2 - 1$ and press EXE or Enter. Select the result and drag it to the Geometry window. Did your equation graph?
- Get a **screen capture**. Add two blank spaces following the second screen capture and paste this one.

PART IV

Reflection Exercises

You have just completed the third lesson in ClassPad 101. Geometry is great, and we will use it a lot in the future. Please take a few moments to copy and paste the following three questions at the end of your Lesson3 document and answer them.

1. Approximately how long did it take you to complete this lesson?
2. Which activity did you enjoy the most?
3. Did you find any part of this activity difficult to follow? If so, which part? Also, how did you overcome the difficulty?

Assessment 3: Introduction to Geometry

- **Checkpoint:** Your word processed document, titled "Lesson3", should contain the following activities:
 1. Three screen captures from PART I.
 2. Three screen captures from PART II.
 3. Three screen captures from PART III.
 4. Three reflection questions with answers from PART IV.
- **Submit** your **Lesson3 document** to your instructor for grading. Once your lesson is submitted, your lesson for ClassPad 101 "Intro to Geometry" is complete.