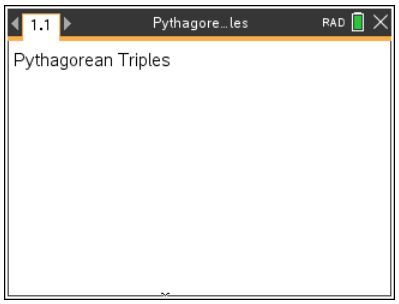
Pythagorean Triples
Geometry—Creating a Document

Activity Overview:

This activity gives directions for constructing a right triangle such that the measures of the legs have whole number values. You will explore when the measure of the hypotenuse is a whole number and discover some Pythagorean Triples.



Materials

• *Technology needed (TI-Nspire™ handheld, computer software)*

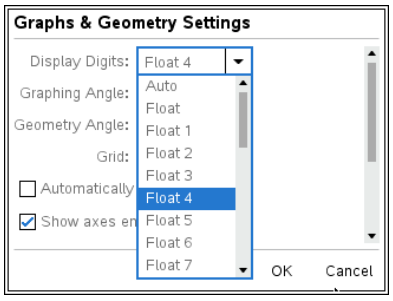
Step 1 Preparing the document

1. Open a new document by clicking on

   [on] > **New Document > Add Notes**.

2. Type **Pythagorean Triples**.

Note: To obtain capital letters, press the [shift] key, then the letter.

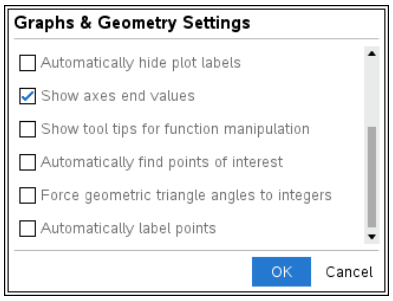


3. Press [doc] **> File > Save As …**

   Type **Pythagorean_Triples**.

   Tab to [save] and press [enter] .

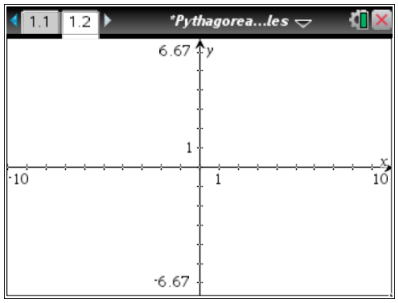
Note: To obtain the underscore, press [ctrl] [␣].



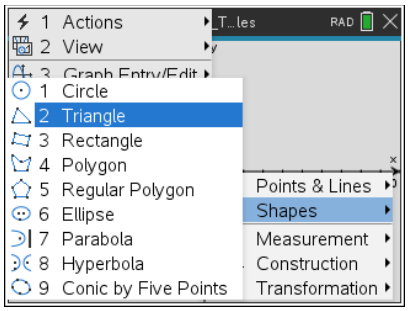
4. To add a new page, press [ctrl] [doc] **> Add Graphs**.

5. Press **Menu > Settings**. Select ***Float 4*** for Display Digits. Then press [tab] to move from one field to the next and press [ ] to uncheck all the boxes besides ***Show axes end values***. Tab to OK and press [ ] or [enter].

6. If needed, press [ctrl] [G] to remove the function entry line.



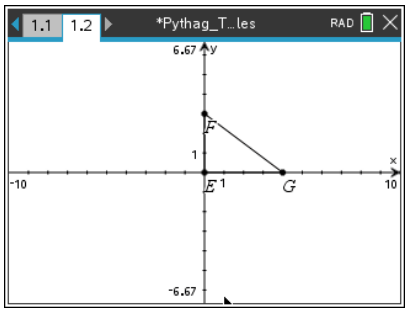
Step 2 Making a triangle



1. To make a triangle, press **Menu > Geometry > Shapes > Triangle**.

Note: Be sure that you place the vertices on a tick mark. You need integer measurements for the legs.

Move the pencil to the origin. It will say *intersection point.* Press enter to place a vertex of the triangle. Label it by pressing ⇧shift E.



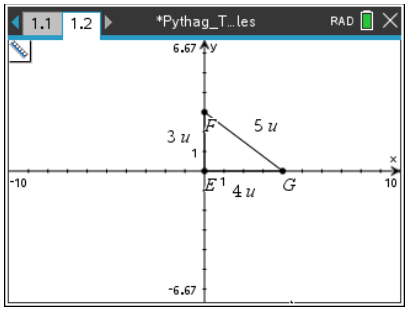
2. Move to a tick mark on the positive *y*-axis. It will say *point on.* Press enter to place the second vertex. Press ⇧shift F to label it.

3. Move to a tick mark on the positive *x*-axis. It will say *point on*. Press enter to place the third vertex. Press ⇧shift G to label it.

Press esc to release the **Triangle** tool.

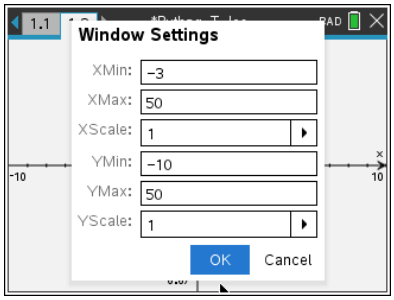
To make sure these vertices are on integer coordinates, drag points *F* and *G*. Both points should jump from one tick mark to another.

Step 3 Measuring the sides of a triangle

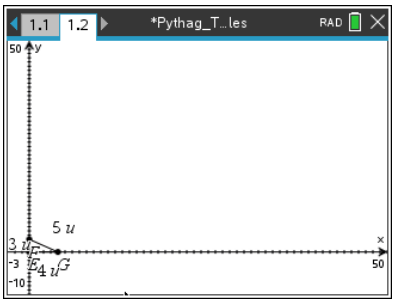


1. To measure the three sides of the triangle, press **Menu > Geometry > Measurement > Length**.
2. Move to a side of the triangle and press tab until the word *side* appears. Press enter to see the measure. Drag to position the measurement. Press enter.
3. Repeat this process for the other two sides.
4. Press esc to release the **Measurement** tool.

Step 4 Adjusting the window settings

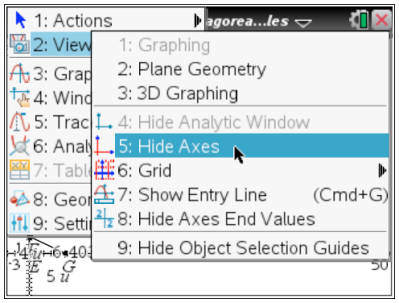


1. To adjust the window settings, press **Menu > Window / Zoom > Window Settings**.
2. Enter the settings as shown in the screen shot to the right. Be sure to use (−) to enter negative numbers. Remember to press tab to move between the settings. Press tab to OK and press enter.

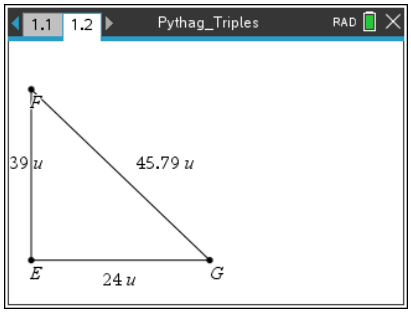


Note: This is not a square window, so isosceles triangles will not look isosceles.

Step 5 Hiding the axes



1. To turn off the axes, press **Menu > View > Hide Axes**.
2. Drag points *F* and *G* to make the triangle larger.
3. Drag the measurements to position them appropriately.

Step 6 Saving the document

1. Press ctrl S.