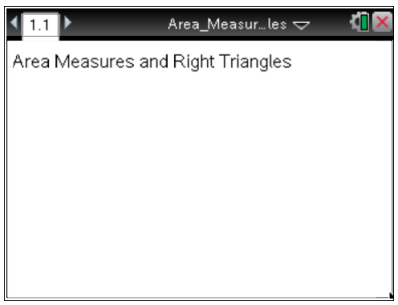
Area Measures and Right Triangles
Geometry—Creating Document



Activity Overview:

In this activity, you will construct a right triangle and then construct an equilateral triangle on each side of the right triangle. You will measure the area of triangles.

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 **Area Measures and Right Triangles**

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

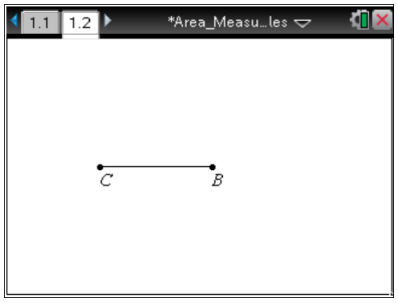
3. Press [doc] **> File > Save As …**

   Type **Area_Measures_and_Right_Triangles**. Tab to [save] and press [enter] .

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

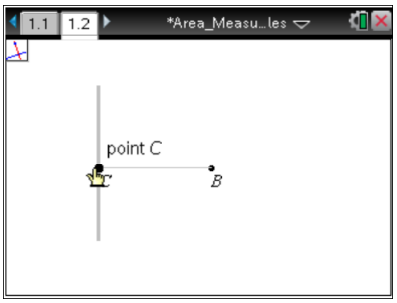
4. To add a new page, press [ctrl] [doc] **> Add Geometry**.
5. To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.
6. To set the number of digits to display the area on the Geometry application, press **Menu > Settings.** Press ▶ once and then ▼ until *Fix 1* appears. Press [enter] [enter].

Step 2 Drawing a segment and labeling its endpoints



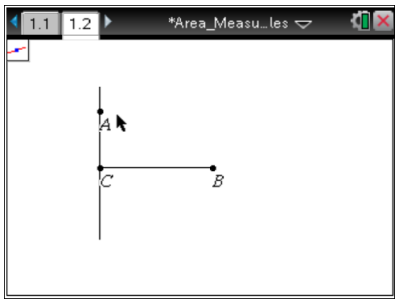
1. Press **Menu > Points & Lines > Segment**.
2. Press [ ] to draw the first endpoint of segment and immediately press [shift] [C] to label the point *C*.
3. Move to another position on the screen and press [ ] to draw the second endpoint and immediately press [shift] [B] to label the point *B*.
4. Press [esc] to exit the **Segment** tool.

Step 3 Constructing a perpendicular



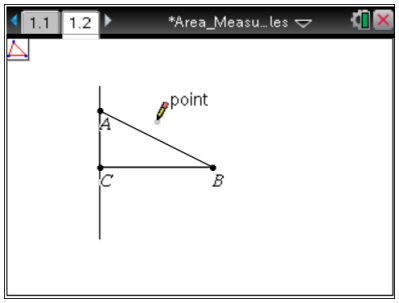
1. Press **Menu > Construction > Perpendicular**.
2. Move cursor to the segment until the words *segment CB* appear. Press ⬚.
3. Then move the cursor until the words *point C* appear and press ⬚.
4. Press esc to exit the **Perpendicular** tool.

Step 4 Drawing the other leg of the right triangle



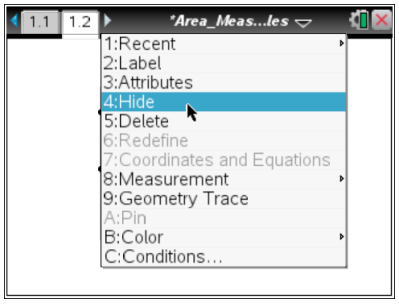
1. Press **Menu > Points & Lines > Point On**.
2. Move to a point on the perpendicular line you just created and press ⬚ to make a point and immediately press ⇧shift A to label this point *A*.
3. Press esc to exit.

Step 5 Drawing right triangle *ABC*



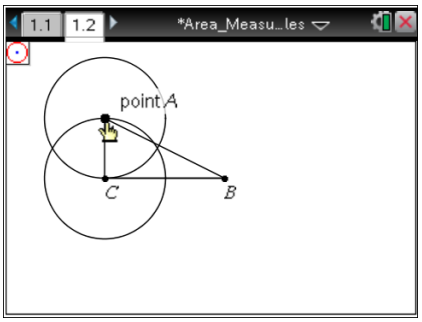
1. Press **Menu > Shapes > Triangle**.
2. Move to each of the points *A*, *B*, and *C,* pressing ⬚ on each.
3. Press esc to exit the **Triangle** tool.

Step 6 Hiding the perpendicular line

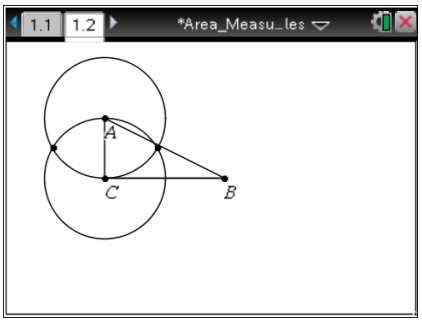


1. Right-click (ctrl menu) on the line and select **Hide**.

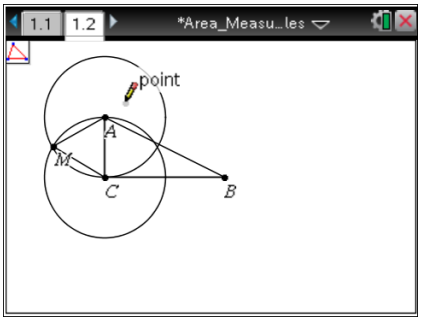
Step 7 Drawing an equilateral triangle on the side of the right triangle with vertices *A* and *C*



1. Press **Menu > Shapes > Circle**.
2. Move to point *A*. Then press ⬚. Move to point *C*. Then press ⬚. This makes a circle with center *A* and radius $\overline{AC}$.
3. Press ⬚ on point *C* (yes again), move to point *A,* and then press ⬚. This makes a circle with center *C* and radius $\overline{AC}$.
4. Press esc to exit the **Circle** tool.

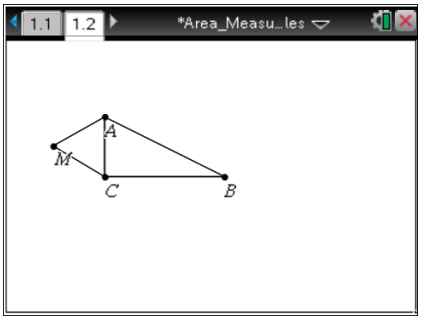


5. Press **Menu > Points & Lines > Intersection Point(s)**.
6. Move until one of the circles is highlighted and press ⬚. Move until the other circle is highlighted and press ⬚.
7. Press esc to exit.
8. Move to near the point of intersection that is not inside Δ *ABC.* Press **Menu > Actions > Text**.
9. Press ⬚, shift M, and enter, to label one of the points as *M* where the two circles intersect. Then press esc to exit.



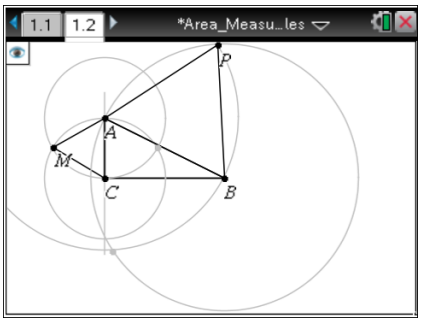
10. Press **Menu > Shapes > Triangle** and click on points *M*, *A*, and *C* in any order to create triangle *MAC.*
11. Press esc to exit the **Triangle** tool.

Step 8 Hide the construction circles and other point of intersection



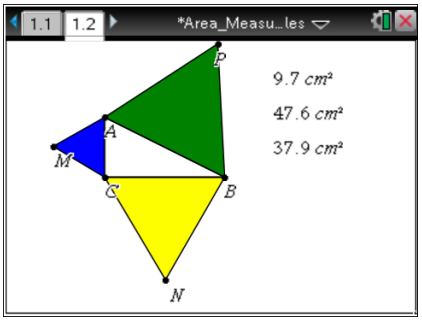
1. Press **Menu > Actions > Hide/Show**.
2. Move until one of the circles is highlighted and press ⬚. Move until the other circle is highlighted and press ⬚. Move until the second point of intersection for the two circles is highlighted and press ⬚.
3. Press esc to exit.

Step 9 Drawing equilateral triangles *BNC* and *APB*



1. Repeat Steps 7 and 8 to draw equilateral triangles *BNC* and *APB*.
2. If desired, right-click (ctrl menu) on a triangle and select **Color > Line Color** or **Color > Fill Color** to add color.

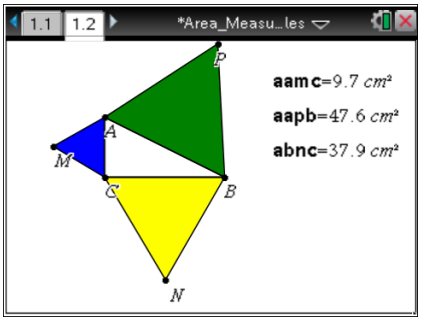
Step 10 Finding the areas of the three equilateral triangles



1. Press **Menu > Measurement > Area**.
2. Move your cursor to any one of the three triangles until the word *triangle* appears.
3. Press . Move the measurement to a good location on the screen and press to leave the value for the area there. Make a mental note as to which value goes with which triangle.
4. Repeat steps 2 and 3 to find the areas of the other two triangles.
5. Press esc to exit the **Area** tool.

Note: Use the abbreviation *aamc* for the area of Δ *AMC*, *aapb* for the area of Δ *APB*, and *abnc* for the area of Δ *BNC*.

Step 11 Assigning measures to variables



1. Press on the measure for the area of triangle *AMC* (*aamc)*.
2. Press var **> Store Var**, and type *aamc* (to represent the area of Δ*AMC*). Press enter.
3. Repeat to assign measures for Δ*BNC* (*abnc*) and Δ*APB* (*aapb*).

Note: If you need to grab each of the three area measurements and move them to the left so that you can see them better, do so.

Step 12 Saving the document

1. Press ctrl S.