Diameter and Circumference of a Circle

ID: 9844

Time required
30 minutes

Activity Overview

In this activity, students explore the relationship between a circle's circumference and its diameter. This will lead students to their own discovery of a value for pi.

Topic: Circles

- *Use technology to verify the circumference and area formulas for the circle.*

Teacher Preparation and Notes

This activity is designed to be used in a high school geometry classroom.

- *Students should already be familiar with circles, diameter, circumference, and pi.*
- *This activity is designed to be **student-centered** with the teacher acting as a facilitator while students work cooperatively. Use the following pages as a framework as to how the activity will progress.*
- ***To download the student worksheet, go to education.ti.com/exchange and enter "9844" in the keyword search box.***

Associated Materials

- *DiameterAndCircumference_Student.doc*

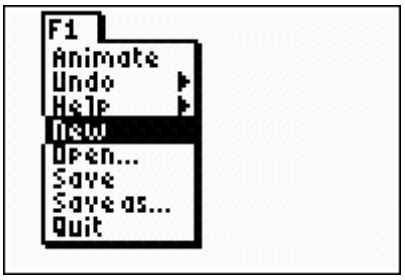
Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.

- *Angles and Arcs (TI-84 Plus family) — 9977*
- *Circle Product Theorems (TI-84 Plus family) — 12512*

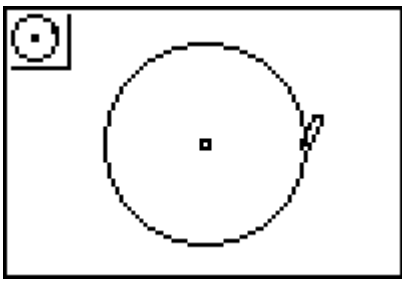
Problem

Press [APPS]. Move down to the Cabri Jr. APP and press [ENTER]. Press [ENTER], or any key, to begin using the application.

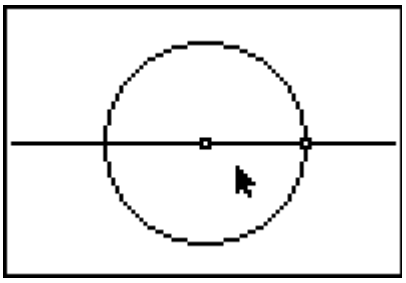


Press [Y=] for the F1 menu and select **New**. (If asked to **Save changes?** press [◄] [ENTER] to choose "No.")

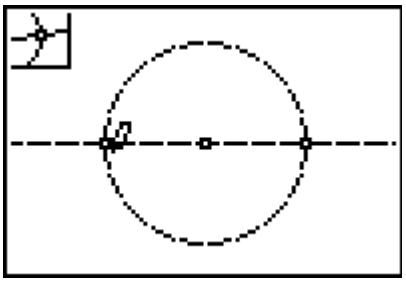
Press [WINDOW] for the F2 menu, move down to **Circle**, and press [ENTER]. Press [ENTER] to mark the center of the circle, then move the pencil to indicate the length of the radius, and press [ENTER] to complete the circle.



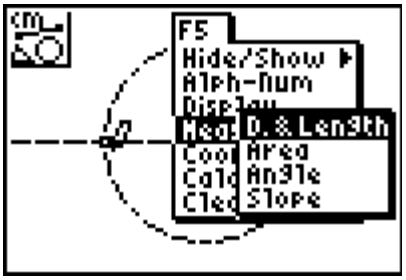
Draw a line through the two points which determined the circle. To do this, press [WINDOW] for the F2 menu, move to **Line**, then press [ENTER]. Move the pencil until the point on the circle is flashing, and press [ENTER]. Now move the pencil until the center of the circle is flashing, and press [ENTER]. Press [CLEAR] to exit the line drawing tool.



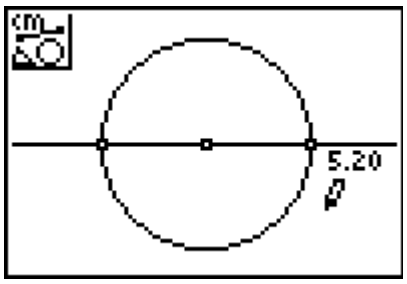
Press [WINDOW] for F2 and move to **Point**. Move to the right and down to select **Intersection**. Press [ENTER]. Move the pencil until both the line and the circle are flashing. Press [ENTER] to mark the point which is the intersection of the circle and the line. Now we have two points on the circle which are the endpoints of a diameter



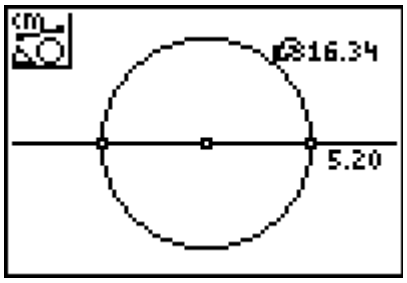
To measure the circle's diameter, press [GRAPH] for F5 and move down and right to select **Measure, D. & Length**. Press [ENTER].



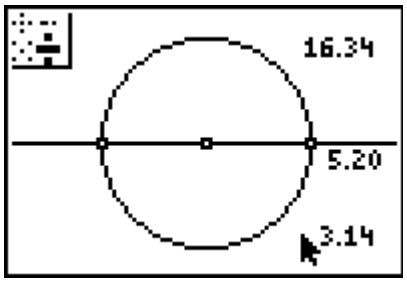
Move the pencil until one endpoint of the diameter is flashing then press ENTER. Move to the other endpoint of the diameter and when it is flashing, press ENTER. Press + to see the measurement rounded to hundredths. The *hand* is active so you can move the measurement to a convenient location then press ENTER.



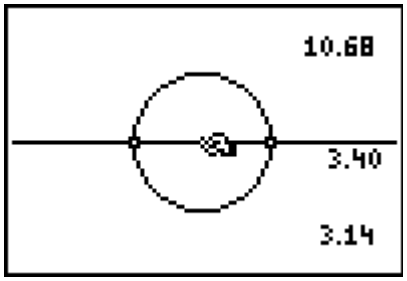
The **Measurement** tool is still active so now you can find the circumference of the circle. Move the pencil until the circle is flashing. Press ENTER then + to see the circumference rounded to hundredths. Move the *hand* until the measurement is in a convenient location. Press ENTER. Press CLEAR to turn off the measurement tool.



Press GRAPH for F5 and move down to **Calculate**. Press ENTER. Move the arrow until the circumference measurement shows a flashing underline and press ENTER then ÷. Move the arrow until the diameter measurement has a flashing underline and press ENTER again. The number displayed is the ratio of the circle's circumference to its diameter.



To explore this relationship with other circles, press CLEAR to turn off the **Calculate** tool. Move the arrow until the point which defined the circle's radius or its center is flashing. Press ALPHA to activate the *hand*. Grab the point and move it to change the size of the circle.



To confirm that the ratio is still 3.14, repeat the **Calculate** procedure. (It is actually being recalculated each time the circle changes, but it is impossible to tell this since the number is unchanging.)

To exit the APP, press Y= for the F1 menu. Move to **Quit**, then press ENTER.