

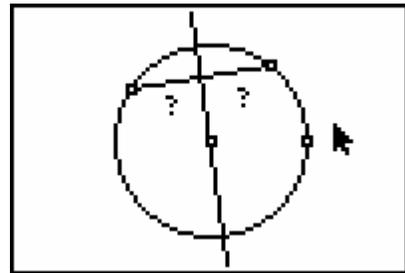


CABRI™ JR. ACTIVITY 20: PERPENDICULAR SEGMENTS IN A CIRCLE

ACTIVITY OVERVIEW:

In this activity we will

- Draw a circle
- Draw a chord
- Draw a line perpendicular to the chord and passing through the center of the circle
- Explore the lengths of the two segments of the chord

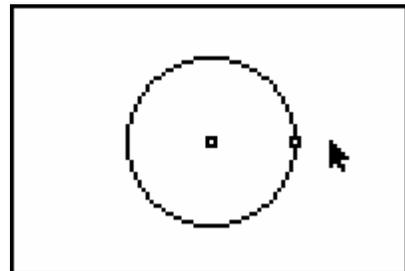


Press **[APPS]**. Move down to the CabriJr APP and press **[ENTER]**. Press **[ENTER]**, or any key, to begin using the application.

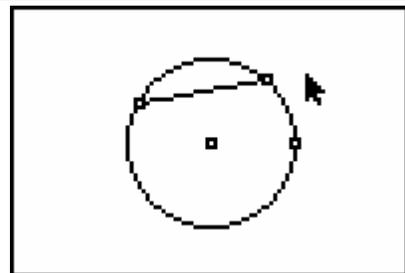
Press **[Y=]** for the F1 menu and select **New**. (If asked to **Save changes?** press **[←]** **[ENTER]** to choose “No.”)



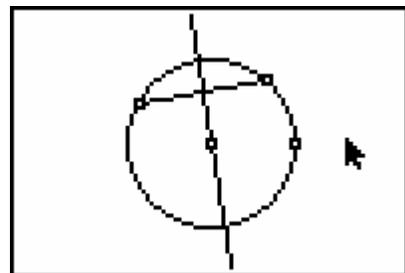
Press **[WINDOW]** for F2, move down to **Circle** and press **[ENTER]**. Move to the desired location of the center and press **[ENTER]**. Move to indicate the length of the radius and press **[ENTER]**. Press **[CLEAR]** to turn off the **Circle** tool.



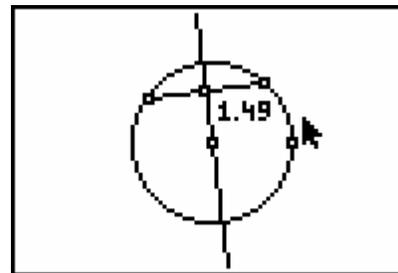
Press **[WINDOW]** for F2, move to **Segment** and press **[ENTER]**. Move the pencil until the circle is flashing and press **[ENTER]** to mark one endpoint of a chord. Move the pencil until the circle is again flashing and press **[ENTER]** to mark the other endpoint of the chord. Press **[CLEAR]** to deactivate the **Segment** tool.



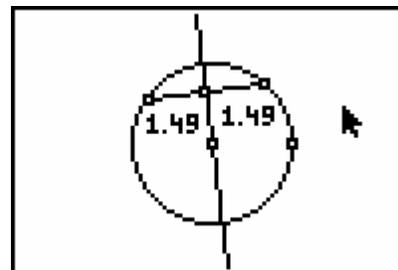
Press **[ZOOM]** for the F3 menu, move to **Perp.** and press **[ENTER]**. Move the pointer until the chord is flashing and press **[ENTER]**. Move the pencil until the center of the circle is flashing and press **[ENTER]**. This will draw a line perpendicular to the chord and through the center. Press **[CLEAR]** to deactivate the **Perp.** tool. What appears to be true about the two parts of the chord?



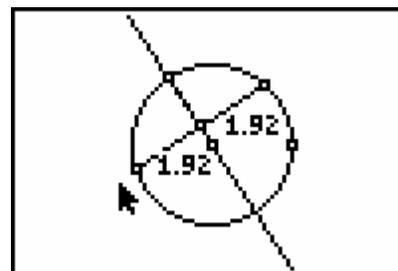
The perpendicular line appears to have bisected the chord. To test this, we will measure the segments. Press **GRAPH** for the F5 menu to measure the lengths of the two segments of the chord. Move down to **Measure** and right to **D & Length**. Press **ENTER**. Move the pencil until one endpoint of the chord is flashing. Press **ENTER**. Move the pencil until the chord and the perpendicular line are flashing and press **ENTER**. This displays the segment length and marks the intersection of the chord and the perpendicular line. Press **+** to see the measurement rounded to hundredths. Move the measurement to a convenient location. Press **CLEAR** to turn off the hand



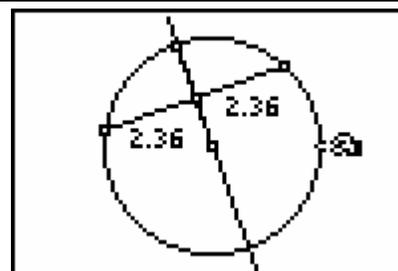
With the measurement tool still active, find the length of the other segment of the chord. Move until the point of intersection of the chord and the perpendicular line is flashing, then press **ENTER**. Move until the other endpoint of the chord is flashing and press **ENTER**. Press **+** to display the measure rounded to hundredths. Move the measurement to a convenient location and press **CLEAR** to deactivate the hand. Press **CLEAR** to exit the measurement tool.



It appears that a line which is perpendicular to a chord and passes through the center of a circle also bisects the chord. Test this conjecture by changing the length or location of the chord. Move the pointer until one endpoint of the chord is flashing. Press **ALPHA** and move the point to a different location. Observe the changes in the segment measures as the chord is moved. You can explore this further by changing the size of the circle.



Since the line perpendicular to the chord passes through the circle's center, it contains a diameter and a radius which are also perpendicular to the chord. This illustrates part of the familiar theorem: In a circle, if a diameter or radius is perpendicular to a chord, then it bisects the chord (and its arc).



To exit the APP, press **Y=** for the F1 menu. Move to **Quit**, then press **ENTER**. (Or you can press **2nd** **MODE** for [QUIT].)

