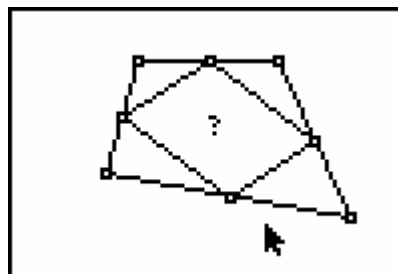


CABRI™ JR. ACTIVITY 18: INVESTIGATING SEGMENTS IN A QUADRILATERAL

ACTIVITY OVERVIEW:

In this activity we will

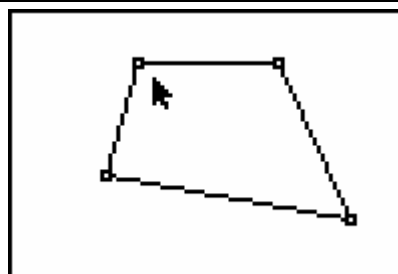
- Draw a quadrilateral
- Find the midpoints of the sides
- Draw segments to join the midpoints of adjacent sides
- Explore characteristics of the shape formed



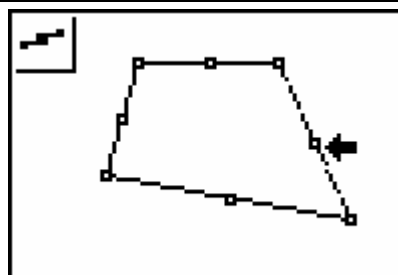
Press **[APPS]**. Move down to the CabriJr APP and press **[ENTER]**. Press **[Y=]** for the F1 menu and select **New**. (If asked to **Save changes?** press **[↩]** **[ENTER]** to choose “No.”)



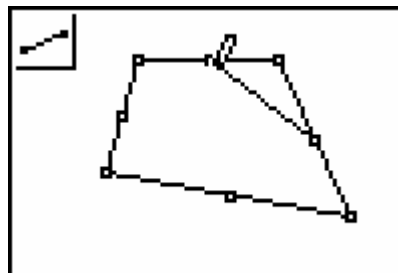
Press **[WINDOW]** for F2, move down to **Quad.** and press **[ENTER]**. Move to the location of a vertex and press **[ENTER]**. Move to the second vertex and press **[ENTER]**. Move to the third vertex and press **[ENTER]**. Move to the fourth vertex and press **[ENTER]**. Press **[CLEAR]** to exit the quadrilateral drawing tool.



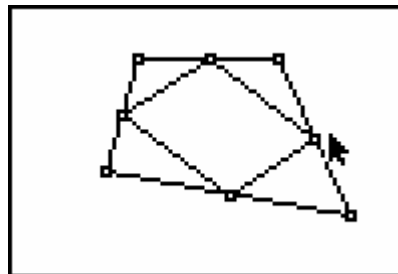
Press **[ZOOM]** for the F3 menu, move down to **Midpoint** and press **[ENTER]**. Move the arrow until a side of the quadrilateral is flashing and press **[ENTER]**. Move until another side of the quadrilateral is flashing and press **[ENTER]**. Move until a third side of the quadrilateral is flashing and press **[ENTER]**. Move until the fourth side of the quadrilateral is flashing and press **[ENTER]**.



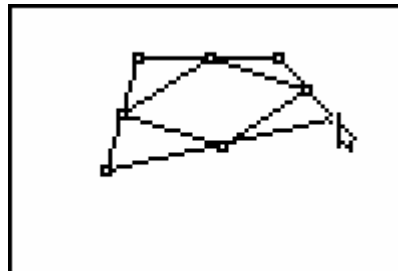
To draw the segments joining the midpoints of adjacent sides, press **[WINDOW]**, move to **Segment** and press **[ENTER]**. Move the pencil until one midpoint is flashing and press **[ENTER]**. Move the pencil until the midpoint of an adjacent side is flashing and press **[ENTER]**.



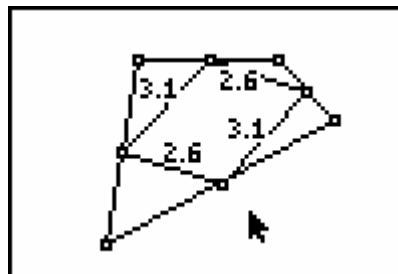
With the same midpoint flashing, press **ENTER** to begin a new segment. Move the pencil until the midpoint of the next side is flashing and press **ENTER**. Press **ENTER** again with that same midpoint flashing and move to the fourth midpoint and press **ENTER**. For the last segment, press **ENTER** with the fourth midpoint flashing. Move to the original midpoint and press **ENTER**. Press **CLEAR** to turn off the midpoint tool.



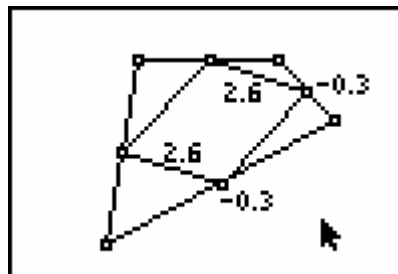
What appears to be true about the quadrilateral formed by connecting the midpoints?
 Move the arrow to a vertex of the original quadrilateral. When the point is flashing, press **ALPHA**. Grab the vertex and move it to change the shape of the original quadrilateral. Observe changes in the quadrilateral formed by the midpoints.



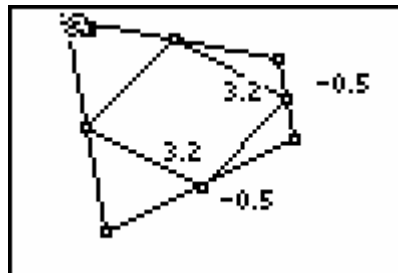
The quadrilateral formed by joining the midpoints appears to be a parallelogram. We can test this conjecture by showing that *both pairs of opposite sides are congruent*. Press **GRAPH** to use the **Measure** and **D. & Length** tool from the F5 menu. Move the pencil until one side of the figure is flashing and press **ENTER**. Repeat to find the measurements for the remaining sides of the quadrilateral.



We can also test the conjecture by showing that *one pair of opposite sides is parallel and congruent*. In the previous step we showed opposite sides congruent, so now we must test their slopes. Press **GRAPH** for F5 and move to **Measure** then right and down to **Slope**. Press **ENTER**. Move the pencil until one side of the figure is flashing and press **ENTER**. Repeat to find the slope of the opposite side of the quadrilateral. Press **CLEAR** to exit the **Slope** tool.



Test this conjecture on other quadrilaterals by moving to a vertex of the original quadrilateral. When the vertex point is flashing, pressing **ALPHA**, change the position of the vertex, and observing the changes in the measurements of the segments and the slopes.



Exit the APP using F1 and selecting Quit, or by pressing **2nd** **MODE** for **QUIT**.

