NAME: _____

CONSTRUCTING A (GENERAL) TRAPEZOID

In your definition, make a statement about the sides and the angles.

A trapezoid is a quadrilateral with _____

_____

Constructing a Trapezoid on the Geometer's Sketchpad

1.) Go to the **Edit Menu** and select **Preferences**. Click the following settings:

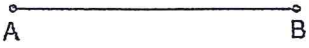
Angle Unit:	Degree	**Precision:**	Units
Distance Unit:	cm	**Precision:**	Tenths
Ratios:		**Precision:**	Tenths

Click **OK**.

2.) Choose the **Segment Tool** and draw an eight or nine centimeter long horizontal line segment towards the bottom of the screen.

3.) Choose the **Selection Arrow Tool** and click in an open part of the screen to deselect the segment.

4.) Choose the **Text Tool** and click on the left endpoint of the line segment to label it point A and click on the right endpoint of the line segment to label it point B. Your sketch should look like this:

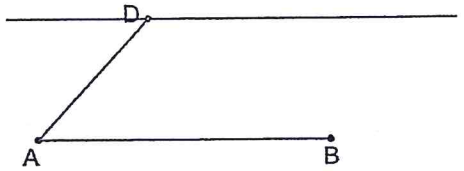


5.) Choose the **Segment Tool** and draw a five or six centimeter line segment beginning at point A and sloping up and to the right.

6.) Choose the **Selection Arrow Tool** and click in an open part of the screen to deselect the line segment.

7.) Choose the **Text Tool** and click on the endpoint of the new line segment to give it a label of D. If the Text Tool does not label the point a D, double click on the letter given and change it to a capital letter D. Click **OK**.

8.) Using the **Selection Arrow Tool**, select point D (it may already be selected from step 7) and the line segment AB. Go to the **Construct Menu** and select the **Parallel Line** option. A line through point D and parallel to line segment AB will appear. Click on an empty portion of the screen to deselect the line segment. Your sketch should now look like this:



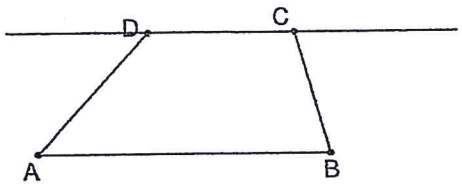
9.) Using the **Selection Arrow Tool**, drag point B to make sure that the new segment stays parallel to segment AB. Put line segment AB horizontal again and click in an empty portion of the screen to deselect point B.

10.) Using the **Selection Arrow Tool**, select the parallel line that goes through point D. Go to the **Construct Menu** and select **Point on Parallel Line**.

11.) Using the **Selection Arrow Tool**, move the new point anywhere on the line to the right of point D and to the left of Point B (which is on the bottom line segment).

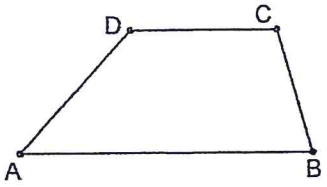
12.) Choose the **Text Tool** and click on the new point to give it a label of C. If the Text Tool does not label the point a C, double click on the letter given and change it to a capital letter C. Click **OK**.

13.) Choose the **Selection Arrow Tool** and highlight point B and C. (Point C may already be highlighted from step 12.) Go to the **Construct Menu** and choose **Segment**. Click in an empty portion of the screen to deselect line segment BC. Your sketch should now look like this:



14.) Using the **Selection Arrow Tool**, select the line through points D and C. Go to the **Display Menu** and select **Hide Parallel Line**.

15.) Using the **Selection Arrow Tool**, highlight point D and point C. Go to the **Construct Menu** and choose **Segment**. Click in an empty portion of the screen to deselect line segment DC. Your trapezoid is now complete, and should look like this:



16.) Using the **Selection Arrow Tool**, drag point B around. If your trapezoid stays together the way it should, call the teacher over for initials: _____

17.) Using the **Selection Arrow Tool,** select the four sides of your trapezoid. Go to the **Measure Menu** and select **Length**. All four line segments should appear on the screen. Record the lengths below.

$m\overline{AB} =$ _____

$m\overline{BC} =$ _____

$m\overline{CD} =$ _____

$m\overline{DA} =$ _____

18.) Click anywhere on the screen to deselect the side length measurements.

19.) Use the **Selection Arrow Tool**, click on Points BAD in that order to measure Angle A. Angles are named by three points. The identified angle is the letter in the middle. Angle A could have also been measured by clicking on Points DAB. Go to the **Measure Menu** and select **Angle**. Click anywhere on the screen to deselect the angle measurement.

$m\angle BAD =$ _____

20.) Use the **Selection Arrow Tool** and click on Points ABC or Points CBA. Go to the **Measure Menu** and select **Angle**. Click anywhere on the screen to deselect the angle measurement.

$m\angle ABC =$ _____

21.) Use the **Selection Arrow Tool** and click on Points BCD or Points DCB. Go to the **Measure Menu** and select **Angle**. Click anywhere on the screen to deselect the angle measurement.

$m\angle BCD =$ _____

22.) Use the **Selection Arrow Tool** and click on Points CDA or Points ADC. Go to the **Measure Menu** and select **Angle**. Click anywhere on the screen to deselect the angle measurement.

$m\angle CDA =$ _____

23.) Use the **Selection Arrow Tool** and go to the **Measure Menu** and select **Calculate**. Click on one of the angle measurements, then the addition sign, etc. Once all the angles have been included in the addition sentence, click OK. Click anywhere in an open part of the screen to deselect the sum of the angles.

What is the sum of the angles of the trapezoid?

_____

22.) Using the **Selection Arrow Tool**, drag point B around. As your trapezoid is changing, what happens to the sum of the angles of the trapezoid?

_____

23.) What do you notice about the properties of the trapezoid? What are the similarities and differences between trapezoids and the other special quadrilaterials you have investigated such as squares, rhombi, rectangles and parallelograms?