



Angles and Parallel Lines

You can use Cabri Junior to investigate the measures of angles formed by two parallel lines and a transversal.

Step 1 Draw parallel lines.

- Draw \overleftrightarrow{AB} .

KEYSTROKES: F2 \blacktriangledown **ENTER**

Position the pointer on the screen and press **ENTER** to set point A . Move the cursor and press **ENTER** to set point B . Then press **CLEAR**.

- Place point C so that it does not lie on \overleftrightarrow{AB} .

KEYSTROKES: F2 \blacktriangle \blacktriangleright **ENTER**

Position the cursor so that it is not on \overleftrightarrow{AB} and press **ENTER** **CLEAR**.

- Construct a line through C parallel to \overleftrightarrow{AB} .

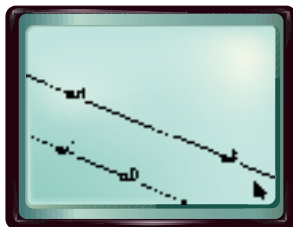
KEYSTROKES: F3 \blacktriangledown **ENTER**

Select point C and press **ENTER**. Then move the pointer to \overleftrightarrow{AB} and press **ENTER** **CLEAR**.

- Place point D on this line.

KEYSTROKES: F2 **ENTER**

Move the pointer to the line parallel to \overleftrightarrow{AB} and press **ENTER** **CLEAR**.



Step 2 Construct a transversal.

- Construct \overleftrightarrow{EF} as a transversal through \overleftrightarrow{AB} and \overleftrightarrow{CD} .

KEYSTROKES: F2 \blacktriangledown **ENTER**

Position the pointer on \overleftrightarrow{AB} and press **ENTER**. Then place the pointer on \overleftrightarrow{CD} and press **ENTER** **CLEAR**.

- Place points G and H on \overleftrightarrow{EF} , as shown.

KEYSTROKES: F2 \blacktriangle \blacktriangleright **ENTER**

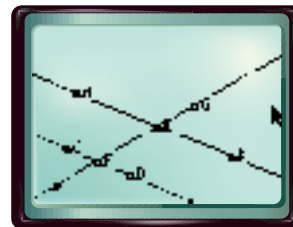
Move the pointer above \overleftrightarrow{AB} on \overleftrightarrow{EF} and press **ENTER**. Position the pointer below \overleftrightarrow{CD} and press **ENTER** **CLEAR**.

Step 3 Measure angles.

- Measure each angle.

KEYSTROKES: F5 \blacktriangledown \blacktriangledown \blacktriangledown \blacktriangleright \blacktriangledown \blacktriangledown

To find $m\angle AEG$, place the pointer on A and press **ENTER**. Next, place the pointer on E and press **ENTER**. Then place the pointer on G and press **ENTER** **CLEAR**. Repeat the procedure for each angle.



Analyze

- List pairs of angles by the special names you learned in Lesson 3-1.
- Which pairs of angles listed in Exercise 1 have the same measure?
- What is the relationship between consecutive interior angles?

Geometry Software Investigation

Make a Conjecture

4. Make a conjecture about the following pairs of angles formed by two parallel lines and a transversal. Write your conjecture in if-then form.
 - a. corresponding angles
 - b. alternate interior angles
 - c. alternate exterior angles
 - d. consecutive interior angles
5. Rotate the transversal. Are the angles with equal measures in the same relative location as the angles with equal measures in your original drawing?
6. Test your conjectures by rotating the transversal and analyzing the angles.
7. Rotate the transversal so that the measure of any of the angles is 90° .
 - a. What do you notice about the measures of the other angles?
 - b. Make a conjecture about a transversal that is perpendicular to one of two parallel lines.