Materials

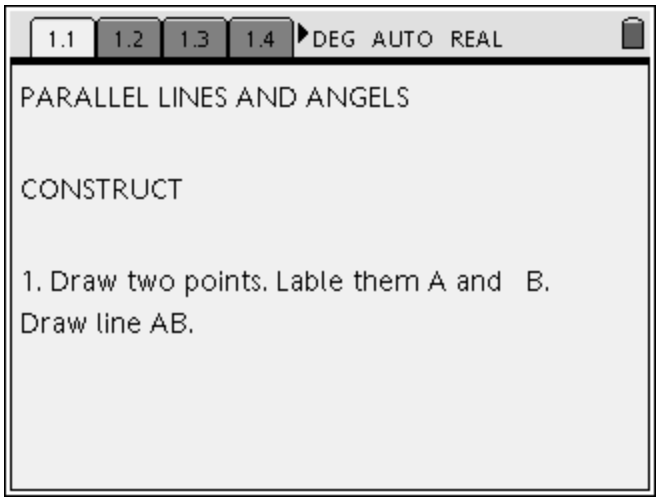
- TI-Nspire Math and Science Learning Handheld
- Parallel Lines and Angles Worksheet

Teacher's COPY

Introduction

The following problem is related to Parallel lines and angles.

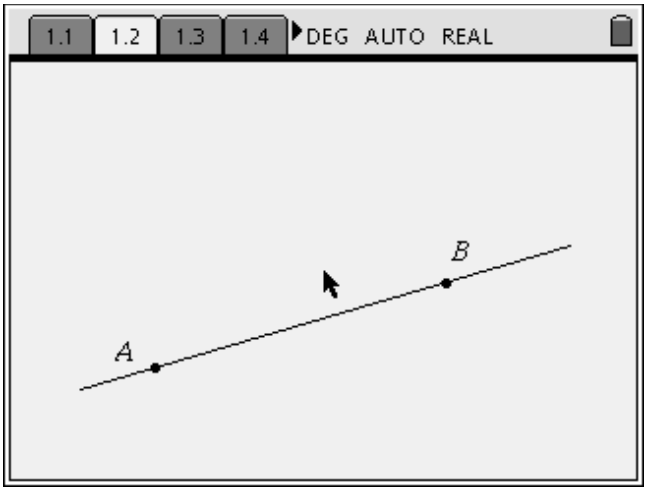
You can use TI-Nspire Handheld to explore the properties of parallel lines.



CONSTRUCT

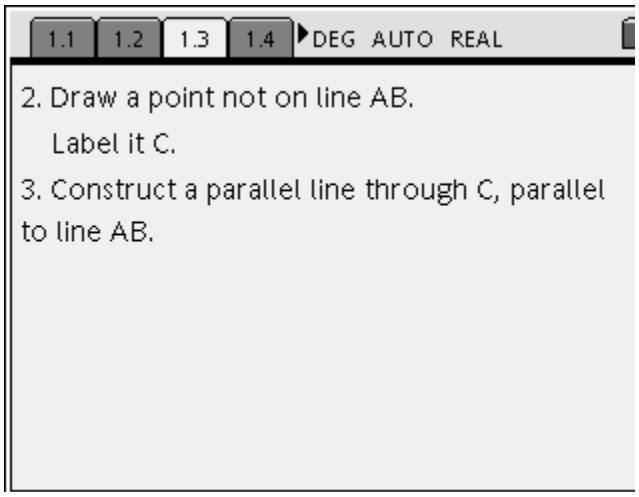
Construct line AB.

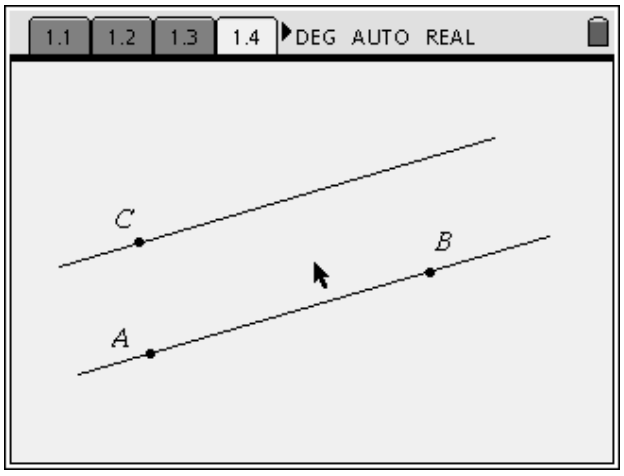
1. Choose the (home)(2) for Home 2: Graphs and Geometry.
2. Press (menu), choose 1: Tools ▸, 2: Hide/Show, followed by (menu), choose 2: View ▸ 1: Hide Axes. Repeat (menu), choose 2: View ▸ 3: Hide Entry Line (Ctrl G).
3. To draw points A and B; now press (menu), choose 6: Points and Lines ▸ 2: Point
4. Draw line AB by joining the two points. Press (menu), choose 6: Points and Lines ▸ 4: Line.
5. Note: Label the points immediately you make them



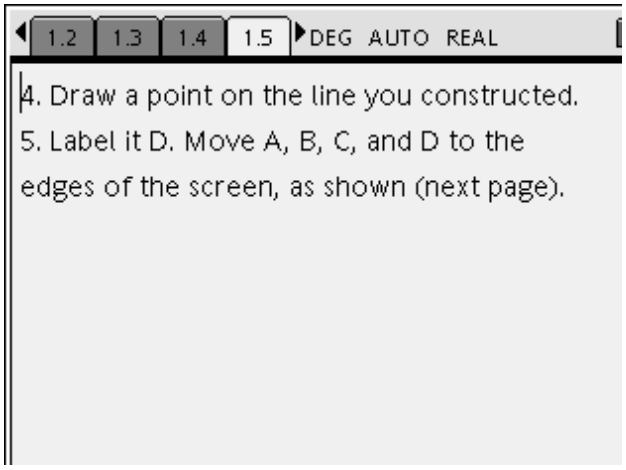
Draw a point not on line *AB*. Label it *C*.
Parallel line to line AB through point C

1. Draw point C; Press (menu), choose 6: Points and Lines ▸, 1: Point
2. Label point C immediately you make it.
3. Press (menu), choose 9: Construction ▸ 2: Parallel
4. Press (enter) at point C followed by moving the cursor to line AB and pressing (enter).

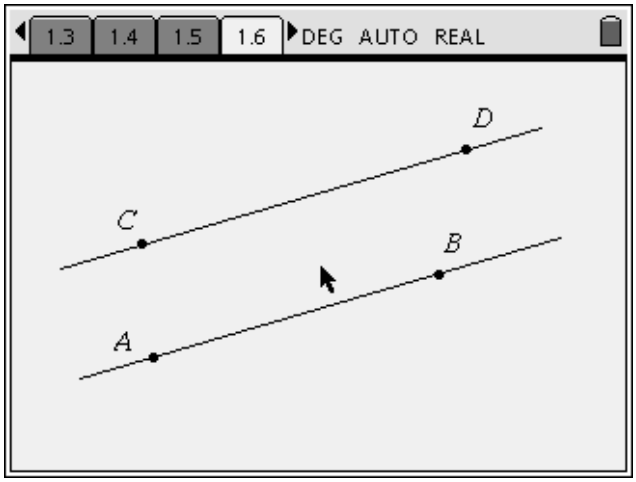




Draw a point on the line you constructed.
Label it *D*.

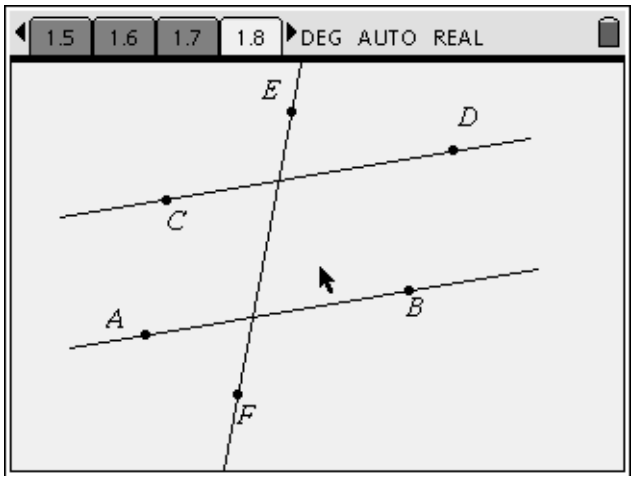


Move *A*, *B*, *C*, and *D* to the edges of the screen, as shown.

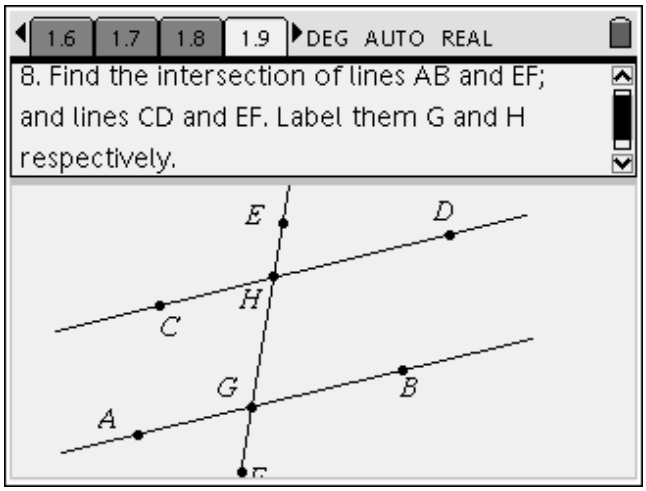


Draw two points outside the parallel lines. Label them *E* and *F*. Draw transversal line *EF*.

1. Press (menu), choose 6: Points and Lines ▸, 1: Point; Label it E immediately. Repeat for point F.
2. Draw transversal line EF by pressing (menu), choose 6: Points and Lines ▸, 4: Line; join points E and F.



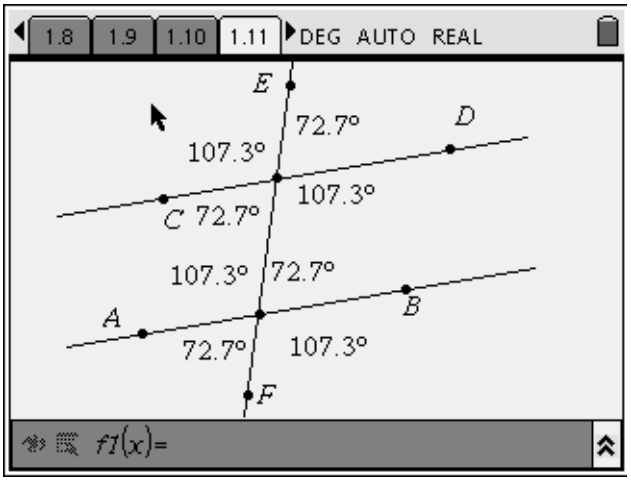
Find the intersection of line *AB* and transversal line *EF*. Label it *G*. Find the intersection of line *CD* and transversal line *EF*. Label it *H*.



INVESTIGATE

1. Measure all eight angles formed by the three lines. What do you notice?

Answers will vary. Sample answers: see picture at right. The corresponding angles are congruent. The alternate interior angles are congruent.



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2. Drag line AB on the side of B to change the angle the transversal makes with the parallel lines.
Be sure *E* and *F* stay outside the parallel lines. What do you notice?

Sample answers: The corresponding angles are always congruent. The alternate interior angles are always congruent.

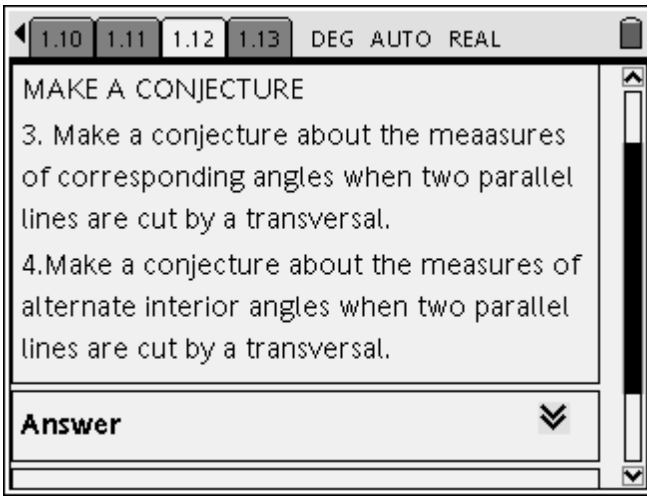
MAKE A CONJECTURE

3. Make a conjecture about the measures of corresponding angles when two parallel lines are cut by a transversal.

Sample answer: If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent. The alternate interior angles are congruent.

4. Make a conjecture about the measures of alternate interior angles when two parallel lines are cut by a transversal.

Sample answer: if two parallel lines are cut by a transversal, then the pairs of alternate angles are congruent.



EXTENSION

CRITICAL THINKING Calculate the sum of two consecutive interior angles.
Make and test a conjecture about the sum.

Sample conjecture: If two parallel lines are cut by a transversal, then the sum of two consecutive interior angles is 180^o.