Open Investigation 4.3

PARALLEL LINES CONJECTURE

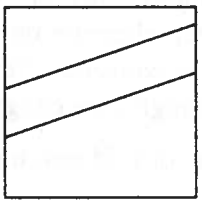
Serra, Michael. (1994) Patty Paper Geometry. California: Key Curriculum Press.

corresponding angles

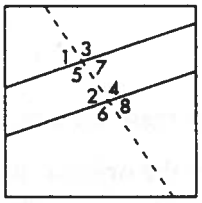
alternate interior angles

alternate exterior angles

Step 1: Draw a pair of parallel lines on a patty paper.



Step 2: Fold or draw a line that intersects the two parallel lines. Label the angles as shown in the diagram.



Step 3: Use another patty paper to trace a pair of corresponding angles and compare their measures.

Step 4: Repeat step 3 for a pair of alternate interior angles and a pair of alternate exterior angles.

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Compare your results with the results of others near you. You have made discoveries about three types of congruent angles formed when two parallel lines are intersected by a transversal. See if you can combine these findings into one conjecture.

PPC **24** _____

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_____ (Parallel Lines Conjecture)

Explain why it is true that if corresponding angles are congruent, then alternate interior angles and alternate exterior angles must also be congruent.

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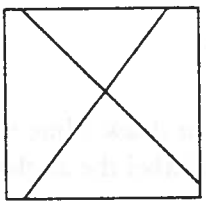
The Parallel Lines Conjecture says that if two parallel lines are intersected by a third line (a transversal), then alternate interior angles, alternate exterior angles, and corresponding angles are congruent. Is the converse of this conjecture also true? That is, if a transversal intersects two lines and corresponding angles are congruent, are the two lines parallel? Complete this investigation to find out.

Step 1: Draw or fold two intersecting lines.



Step 2: Copy these lines onto another patty paper.

Step 3: Place the original patty paper over the copy so that part of one of the original lines lies on its copy. Then trace the lines and angles from the copy onto the original paper.

Step 4: Determine whether the two lines are parallel.

Explain what you did to determine whether the lines are parallel.

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Write a conjecture about corresponding angles and lines cut by a transversal.

PPC **25** _____

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_____ (Converse of the Parallel Lines Conjecture)