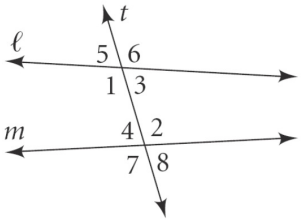
2.5 Getting Started

Objective: Students will identify pairs of congruent angles when a transversal cuts parallel lines.

transversal - a line that intersects two or more lines

Example 1



Vertical angles - ∠1 and ∠6
∠3 and ∠5
∠4 and ∠8
∠2 and ∠7

Alternate interior angles - ∠1 and ∠2
∠3 and ∠4

Same-side interior angles - ∠1 and ∠4
∠2 and ∠3

Corresponding angles - ∠1 and ∠7, ∠5 and ∠4,
∠6 and ∠2, ∠3 and ∠8

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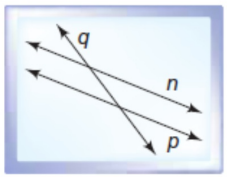
For You to Explore

Use geometry software to complete Problems 1 and 2.

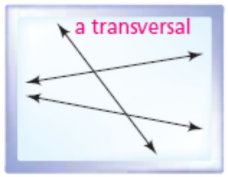
1. Construct a pair of parallel lines cut by a transversal. Measure the angles.



   a. Move the transversal while the parallel lines remain fixed. Which angles stay congruent? Move one of the parallel lines while keeping them parallel. Which angles stay congruent?

   b. Which sums of angle measures are invariant?

2. Construct a pair of intersecting lines cut by a transversal. Measure the angles.

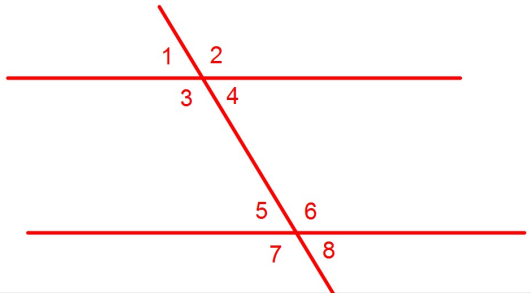


   a. Move the transversal while the intersecting lines remain fixed. What invariants can you find? Move one of the intersecting lines while the transversal remains fixed. What invariants can you find?

   b. How do the angle measures compare to the angle measures in Problem 1? How do the sums of angle measures compare to the sums of angle measures in Problem 1?

Open up 1.1
You should see 2 parallel lines and a transversal.

1. Grab the transversal and move it to the left and right. Notice what happens to the angles.
2. Draw a diagram similar to what is below and summarize what you observed on the calculator.
3. Which angles are the same? What types of angles are they?
4. Do any of the angles add to a constant number? What types and what do they equal?



Open up 1.2
You should see 2 lines not Parallel to each other and a transversal

1. Grab the transversal and move it to the left and right. Notice what happens to the angles.
2. Does the same happen as when the lines were parallel?

So, what can you conclude about the lines and the angles?

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6. Use the figure at the right. Find the measures of $\angle BDA$, $\angle ADQ$, and $\angle CDQ$ for the following conditions.

a. $m\angle BDC = 62°$ **b.** $m\angle BDC = 72°$

c. $m\angle BDC = 55°$ **d.** $m\angle BDC = x°$