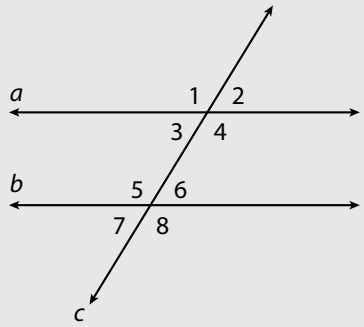
24 Properties of Angles

G.2.C

Example

Lines *a* and *b* are parallel. They have been cut by transversal *c*.



Which names a pair of vertical angles?

A. ∠1 and ∠2
B. ∠3 and ∠4
C. ∠5 and ∠8
D. ∠6 and ∠8

Thinking It Through

Look Vertical angles are the *opposite* angles formed by two intersecting lines. Look at choice A: ∠1 and ∠2 are adjacent (or next to each other), not opposite. The same is true of choice B, ∠3 and ∠4. Now look at choice C. ∠5 and ∠8 are opposite each other, so they are vertical angles.

The answer is *C, ∠5 and ∠8.*

Review

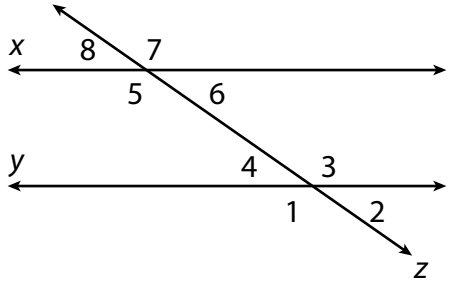
- **Vertical angles** are the opposite angles formed by two **intersecting lines**. Vertical angles are **congruent**.
- **Complementary angles** are two angles whose measures, when added together, equal 90°. **Supplementary angles** are two angles whose measures, when added together, equal 180°.
- **Adjacent angles** share a common side and a common vertex and do not overlap.
- Two nonadjacent angles formed by a **transversal** crossing parallel lines are **alternate interior angles** if they are between the **parallel** lines and on opposite sides of the transversal. In the Example, ∠3 and ∠6 are alternate interior angles, as are ∠4 and ∠5. Alternate interior angles are congruent.
- **Alternate exterior angles** are a pair of angles located outside a set of parallel lines and on opposite sides of the transversal. In the Example, ∠2 and ∠7 are alternate exterior angles, as are ∠1 and ∠8. Alternate exterior angles are congruent.
- **Corresponding angles** are two angles in corresponding (or similar) positions formed by a transversal crossing two lines. In the Example, the pairs of corresponding angles are ∠1 and ∠5, ∠2 and ∠6, ∠3 and ∠7, and ∠4 and ∠8. Corresponding angles formed by parallel lines have the same measure (or are congruent).

Properties of Angles

24

Directions: Carefully read each question. Circle the letter of the correct answer.

Use the diagram for questions 1 through 4. Lines *x* and *y* are parallel.



1. Which pair of angles can be classified as corresponding angles?

   A. ∠1 and ∠6

   B. ∠2 and ∠7

   C. ∠3 and ∠5

   D. ∠4 and ∠8

2. Which pair of angles can be classified as alternate exterior angles?

   A. ∠1 and ∠7

   B. ∠1 and ∠8

   C. ∠2 and ∠7

   D. ∠1 and ∠6

3. Which pair of angles can be classified as supplementary angles?

   A. ∠1 and ∠3

   B. ∠2 and ∠4

   C. ∠1 and ∠4

   D. ∠2 and ∠6

The sum of the measures of two angles that are supplementary is 180°. If two angles form a straight angle, they are supplementary.

4. Which pair of angles can be classified as vertical angles?

   A. ∠5 and ∠6

   B. ∠5 and ∠7

   C. ∠6 and ∠7

   D. ∠7 and ∠8