

## Activity 9 — Properties of Parallelograms

### Objectives

This activity is designed to help students discover the following theorems:

- ✓ *If a quadrilateral is a parallelogram, then its opposite sides are congruent.*
- ✓ *If a quadrilateral is a parallelogram, then its opposite angles are congruent.*
- ✓ *If a quadrilateral is a parallelogram, then its consecutive angles are supplementary.*
- ✓ *If a quadrilateral is a parallelogram, then its diagonals bisect each other.*

### Vocabulary

|                 |                    |
|-----------------|--------------------|
| parallelogram   | segment            |
| parallel        | angle              |
| opposite angles | consecutive angles |
| congruent       | diagonal           |
| bisect          | intersection       |
| supplementary   |                    |

### Prerequisites

Students must understand how to:

- ✓ *Construct and label a segment.*
- ✓ *Construct parallel lines.*
- ✓ *Measure and label sides.*
- ✓ *Measure and label angles.*

### Answers

3. Sides  $AD$  and  $BC$  are congruent.
4. Sides  $AB$  and  $CD$  are congruent.
6. The relationship does not change.
7. The result does not change.
8. If a quadrilateral is a parallelogram, then its opposite sides are congruent.
10.  $\angle A$  and  $\angle C$  are congruent.
11.  $\angle B$  and  $\angle D$  are congruent.
13. The relationship does not change.
14. The result does not change.
15. If a quadrilateral is a parallelogram, then its opposite angles are congruent.
16.  $\angle A$  and  $\angle B$  are supplementary.
17.  $\angle B$  and  $\angle C$  are supplementary.
19. Yes, the relationship is the same.
20. The result does not change.
21. If a quadrilateral is a parallelogram, then its consecutive angles are supplementary.

- 26. The diagonals bisect each other.
- 28. Yes, the relationship is the same.
- 29. The result does not change.
- 30. If a quadrilateral is a parallelogram, then its diagonals bisect each other.