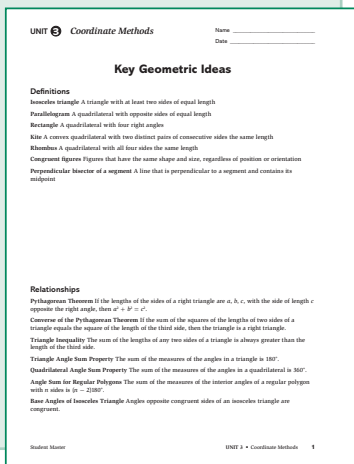


## Teaching Resources

**STUDENT MASTERS** The key geometric ideas listed here are on a student activity master with additional space to record key ideas as they are developed in this unit.

### Student Masters 1–2.



**Key Geometric Ideas from Course 1** This unit builds on important geometric concepts and relationships developed in the Course 1 unit, *Patterns in Shape*. Specifically:

### Definitions

**Isosceles triangle** a triangle with at least two sides of equal length

**Parallelogram** a quadrilateral with opposite sides of equal length

**Rectangle** a quadrilateral with four right angles

**Kite** a convex quadrilateral with two distinct pairs of consecutive sides the same length

**Rhombus** a quadrilateral with all four sides the same length

**Congruent figures** figures that have the same shape and size, regardless of position or orientation

**Perpendicular bisector of a segment** a line that is perpendicular to a segment and contains its midpoint

### Relationships

**Pythagorean Theorem** If the lengths of the sides of a right triangle are  $a$ ,  $b$ ,  $c$ , with the side of length  $c$  opposite the right angle, then  $a^2 + b^2 = c^2$ .

**Converse of the Pythagorean Theorem** If the sum of the squares of the lengths of two sides of a triangle equals the square of the length of the third side, then the triangle is a right triangle.

**Triangle Inequality** The sum of the lengths of any two sides of a triangle is always greater than the length of the third side.

**Triangle Angle Sum Property** The sum of the measures of the angles in a triangle is  $180^\circ$ .

**Quadrilateral Angle Sum Property** The sum of the measures of the angles in a quadrilateral is  $360^\circ$ .

**Polygon Angle Sum Property** The sum of the measures of the interior angles of a polygon with  $n$  sides is  $(n - 2)180^\circ$ .

**Base Angles of Isosceles Triangle** Angles opposite congruent sides of an isosceles triangle are congruent.

**Side-Side-Side (SSS) congruence condition** If three sides of a triangle are congruent to the corresponding sides of another triangle, then the two triangles are congruent.

**Side-Angle-Side (SAS) congruence condition** If two sides and the angle between the sides of one triangle are congruent to the corresponding parts of another triangle, then the two triangles are congruent.

**Angle-Side-Angle (ASA) congruence condition** If two angles and the side between the angles of one triangle are congruent to the corresponding parts of another triangle, then the two triangles are congruent.

**Opposite Angles Property of Parallelograms** Opposite angles in a parallelogram are congruent.

**Condition ensuring a parallelogram** If the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram.

**Conditions ensuring a rectangle** (1) If a parallelogram has one right angle, then it is a rectangle. (2) If the diagonals of a parallelogram are the same length, then the parallelogram is a rectangle.

**$30^\circ$ - $60^\circ$  right triangle relationship** For a right triangle with acute angles of measures  $30^\circ$  and  $60^\circ$ , the length of the side opposite the  $30^\circ$  angle is half the length of the hypotenuse. The length of the side opposite the  $60^\circ$  angle is  $\sqrt{3}$  times the length of the side opposite the  $30^\circ$  angle.

**$45^\circ$ - $45^\circ$  right triangle relationship** For a right triangle with acute angles of measures  $45^\circ$ , the length of the hypotenuse is  $\sqrt{2}$  times the length of a leg of the right triangle.