

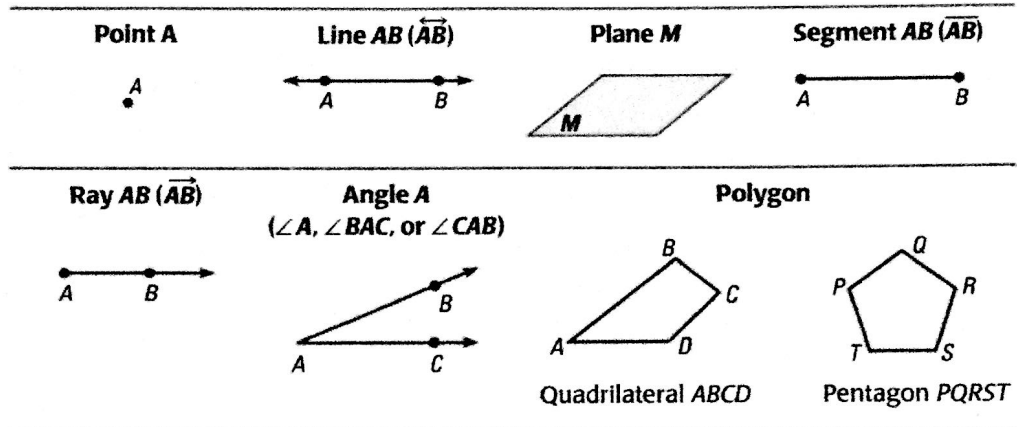
BIG IDEAS

For Your Notebook

Big Idea 1

Describing Geometric Figures

You learned to identify and classify geometric figures.



Big Idea 2

Measuring Geometric Figures

SEGMENTS You measured segments in the coordinate plane.

Distance Formula

Distance between $A(x_1, y_1)$ and $B(x_2, y_2)$:

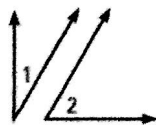
$$AB = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Midpoint Formula

Coordinates of midpoint M of \overline{AB} , with endpoints $A(x_1, y_1)$ and $B(x_2, y_2)$:

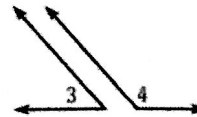
$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

ANGLES You classified angles and found their measures.



Complementary angles

$$m\angle 1 + m\angle 2 = 90^\circ$$



Supplementary angles

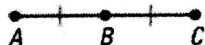
$$m\angle 3 + m\angle 4 = 180^\circ$$

FORMULAS Perimeter and area formulas are reviewed on page 49.

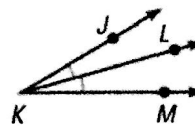
Big Idea 3

Understanding Equality and Congruence

Congruent segments have equal lengths. Congruent angles have equal measures.



$$\overline{AB} \cong \overline{BC} \text{ and } AB = BC$$



$$\angle JKL \cong \angle LKM \text{ and } m\angle JKL = m\angle LKM$$

BIG IDEAS

For Your Notebook

Big Idea 1

Using Inductive and Deductive Reasoning

When you make a conjecture based on a pattern, you use inductive reasoning. You use deductive reasoning to show whether the conjecture is true or false by using facts, definitions, postulates, or proven theorems. If you can find one counterexample to the conjecture, then you know the conjecture is false.

Big Idea 2

Understanding Geometric Relationships in Diagrams

The following can be assumed from the diagram:

A , B , and C are coplanar.

$\angle ABH$ and $\angle HBF$ are a linear pair.

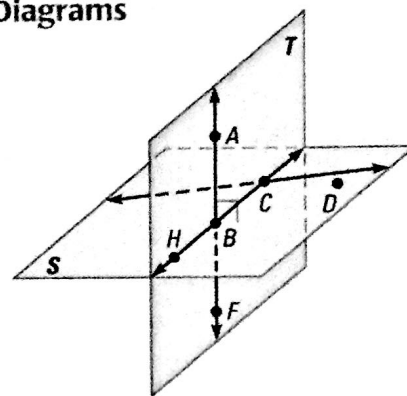
Plane T and plane S intersect in \overleftrightarrow{BC} .

\overleftrightarrow{CD} lies in plane S .

$\angle ABC$ and $\angle HBF$ are vertical angles.

$\overleftrightarrow{AB} \perp$ plane S .

Diagram assumptions are reviewed on page 97.



Big Idea 3

Writing Proofs of Geometric Relationships

You can write a logical argument to show a geometric relationship is true. In a two-column proof, you use deductive reasoning to work from GIVEN information to reach a conjecture you want to PROVE.

GIVEN ► The hypothesis of an if-then statement

PROVE ► The conclusion of an if-then statement

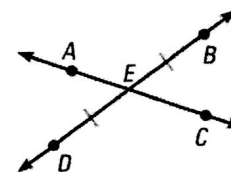


Diagram of geometric relationship with given information labeled to help you write the proof

STATEMENTS

1. Hypothesis

n . Conclusion

Statements based on facts that you know or conclusions from deductive reasoning

Proof summary is on page 114.

REASONS

1. Given

n . _____

Use postulates, proven theorems, definitions, and properties of numbers and congruence as reasons.

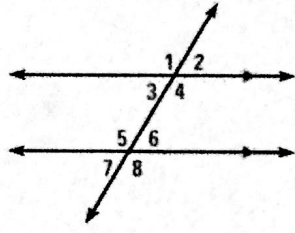
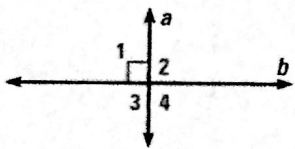
BIG IDEAS

For Your Notebook

Big Idea 1

Using Properties of Parallel and Perpendicular Lines

When parallel lines are cut by a transversal, angle pairs are formed. Perpendicular lines form congruent right angles.

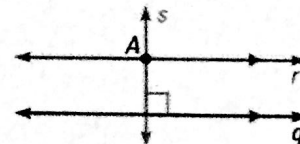
	<p>$\angle 2$ and $\angle 6$ are corresponding angles, and they are congruent.</p> <p>$\angle 3$ and $\angle 6$ are alternate interior angles, and they are congruent.</p> <p>$\angle 1$ and $\angle 8$ are alternate exterior angles, and they are congruent.</p> <p>$\angle 3$ and $\angle 5$ are consecutive interior angles, and they are supplementary.</p>
	<p>If $a \perp b$, then $\angle 1$, $\angle 2$, $\angle 3$, and $\angle 4$ are all right angles.</p>

Big Idea 2

Proving Relationships Using Angle Measures

You can use the angle pairs formed by lines and a transversal to show that the lines are parallel. Also, if lines intersect to form a right angle, you know that the lines are perpendicular.

Through point A not on line q , there is only one line r parallel to q and one line s perpendicular to q .

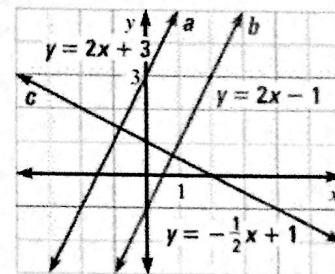


Big Idea 3

Making Connections to Lines in Algebra

In Algebra 1, you studied slope as a rate of change and linear equations as a way of modeling situations.

Slope and equations of lines are also a useful way to represent the lines and segments that you study in Geometry. For example, the slopes of parallel lines are the same ($a \parallel b$), and the product of the slopes of perpendicular lines is -1 ($a \perp c$, and $b \perp c$).




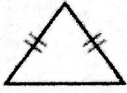

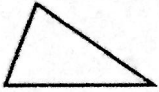

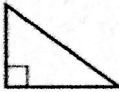
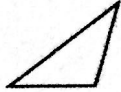
CHAPTER SUMMARY

BIG IDEAS

For Your Notebook

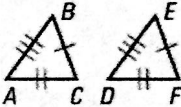
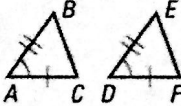
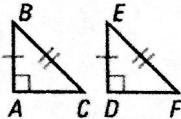
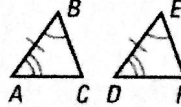
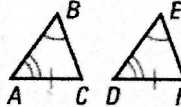
Big Idea 1

Classifying Triangles by Sides and Angles

	Equilateral	Isosceles	Scalene	
Sides				
	3 congruent sides	2 or 3 congruent sides	No congruent sides	
Angles				
	3 angles $< 90^\circ$	3 angles $= 60^\circ$	1 angle $= 90^\circ$	1 angle $> 90^\circ$

Big Idea 2

Proving That Triangles Are Congruent

SSS	All three sides are congruent.	$\triangle ABC \cong \triangle DEF$	
SAS	Two sides and the included angle are congruent.	$\triangle ABC \cong \triangle DEF$	
HL	The hypotenuse and one of the legs are congruent. (Right triangles only)	$\triangle ABC \cong \triangle DEF$	
ASA	Two angles and the included side are congruent.	$\triangle ABC \cong \triangle DEF$	
AAS	Two angles and a (non-included) side are congruent.	$\triangle ABC \cong \triangle DEF$	

Big Idea 3

Using Coordinate Geometry to Investigate Triangle Relationships

You can use the Distance and Midpoint Formulas to apply postulates and theorems to triangles in the coordinate plane.

BIG IDEAS

For Your Notebook

Big Idea 1

Using Angle Relationships in Polygons

You can use theorems about the interior and exterior angles of convex polygons to solve problems.

Polygon Interior Angles Theorem

The sum of the interior angle measures of a convex n -gon is $(n - 2) \cdot 180^\circ$.

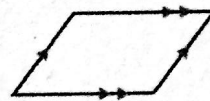
Polygon Exterior Angles Theorem

The sum of the exterior angle measures of a convex n -gon is 360° .

Big Idea 2

Using Properties of Parallelograms

By definition, a parallelogram is a quadrilateral with both pairs of opposite sides parallel. Other properties of parallelograms:



- Opposite sides are congruent.
- Opposite angles are congruent.
- Diagonals bisect each other.
- Consecutive angles are supplementary.

Ways to show that a quadrilateral is a parallelogram:

- Show both pairs of opposite sides are parallel.
- Show both pairs of opposite sides or opposite angles are congruent.
- Show one pair of opposite sides are congruent and parallel.
- Show the diagonals bisect each other.

Big Idea 3

Classifying Quadrilaterals by Their Properties

Special quadrilaterals can be classified by their properties. In a parallelogram, both pairs of opposite sides are parallel. In a trapezoid, only one pair of sides are parallel. A kite has two pairs of consecutive congruent sides, but opposite sides are not congruent.

