

G4a Properties of Kites

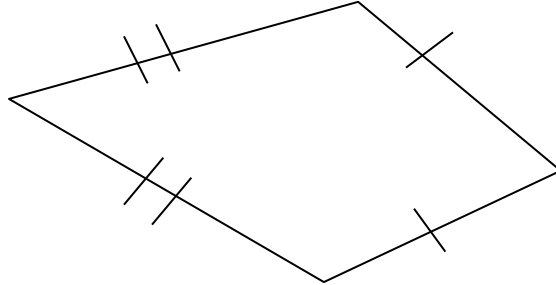
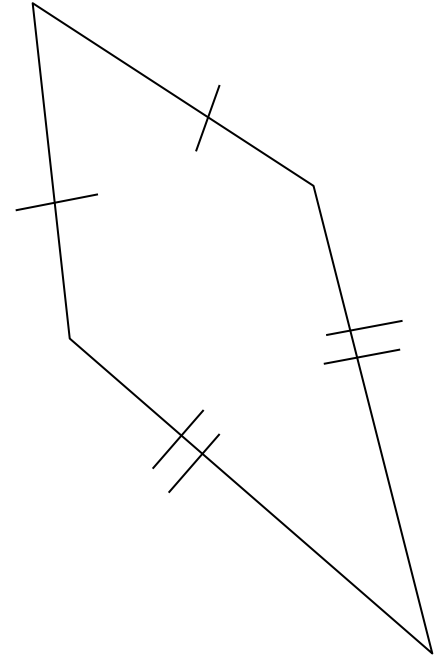
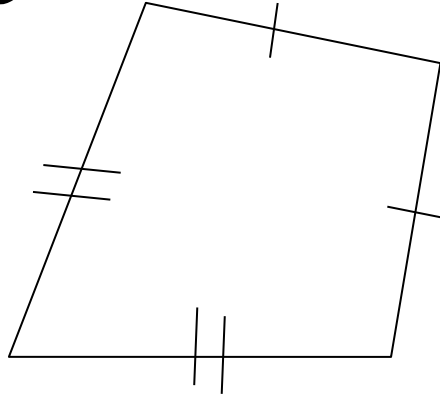
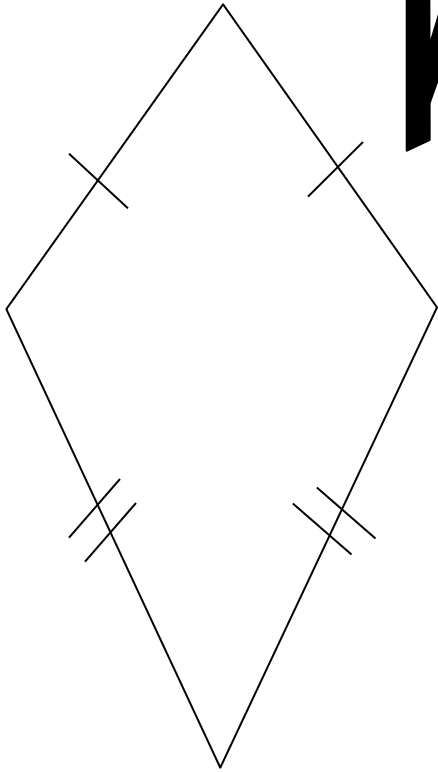
Use the slope of the sides and diagonals to determine whether a parallelogram with vertices $A(2, 7)$, $B(7, 9)$, $C(5, 4)$, and $D(0, 2)$ is a rectangle, rhombus, or square. Give all the names that apply.

G4a Properties of Kites and Trapezoids

Objective: I can use the properties of kites and trapezoids to solve problems.

Homework: pg

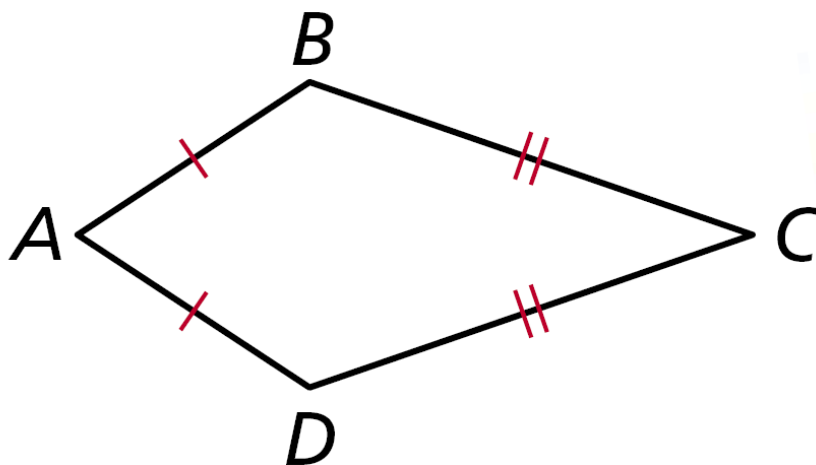
kite



Define *kite* based on the examples.

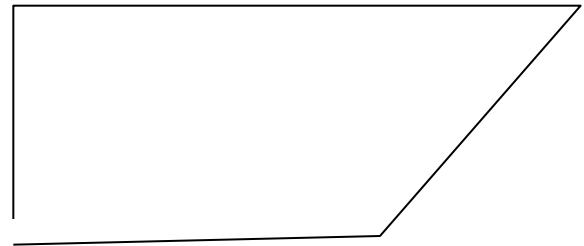
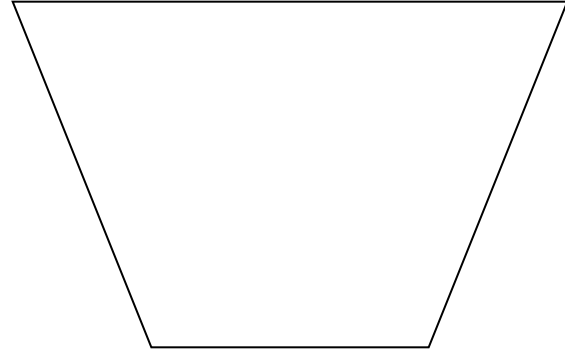
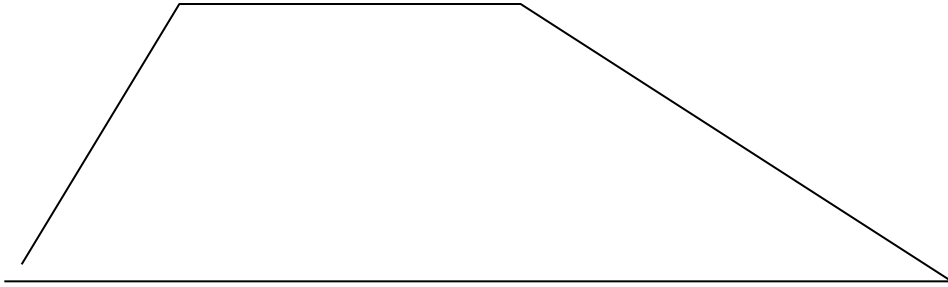
Complete *G4a Kite Exploration*

A **kite** is a quadrilateral with exactly two pairs of congruent consecutive sides.

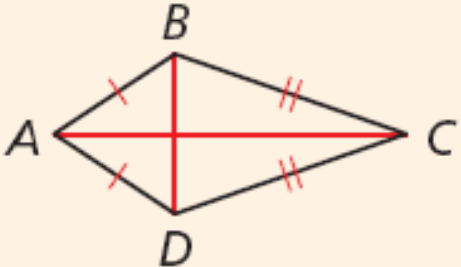
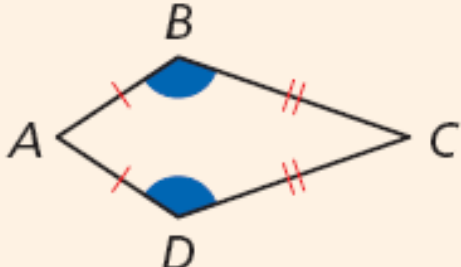


Kite $ABCD$

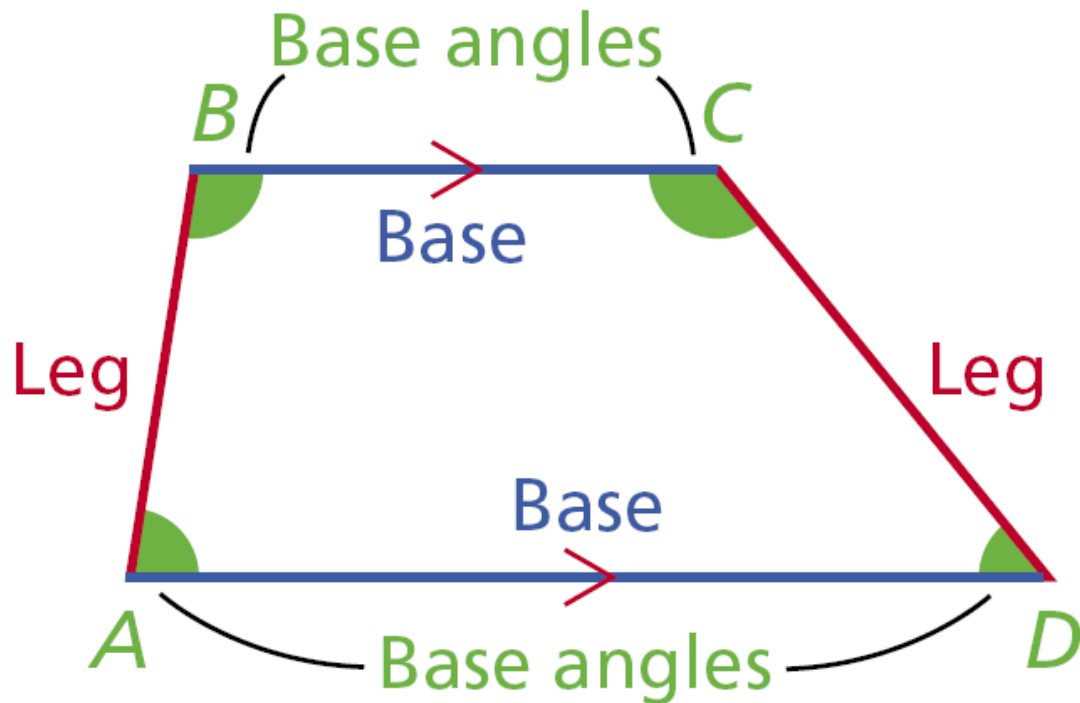
trapezoid



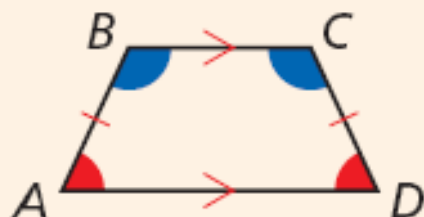
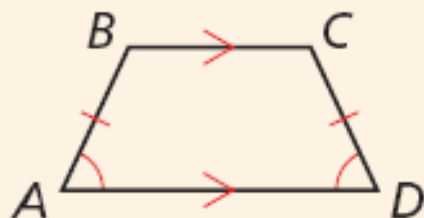

A quadrilateral with exactly one pair of parallel sides.

THEOREM	HYPOTHESIS	CONCLUSION
6-6-1 If a quadrilateral is a kite, then its diagonals are perpendicular. (kite \rightarrow diags. \perp)		$\overline{AC} \perp \overline{BD}$
6-6-2 If a quadrilateral is a kite, then exactly one pair of opposite angles are congruent. (kite \rightarrow one pair opp. $\angle \cong$)		$\angle B \cong \angle D$ $\angle A \not\cong \angle C$

A **trapezoid** is a quadrilateral with exactly one pair of parallel sides. Each of the parallel sides is called a **base**. The nonparallel sides are called **legs**. **Base angles** of a trapezoid are two consecutive angles whose common side is a base.

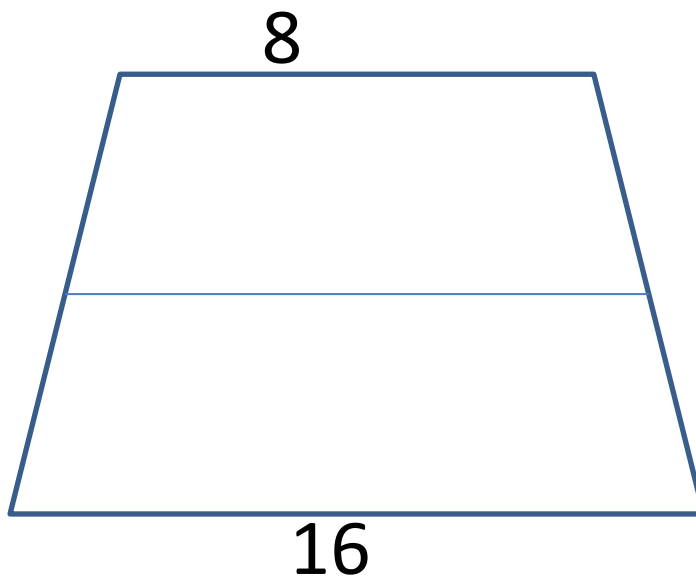
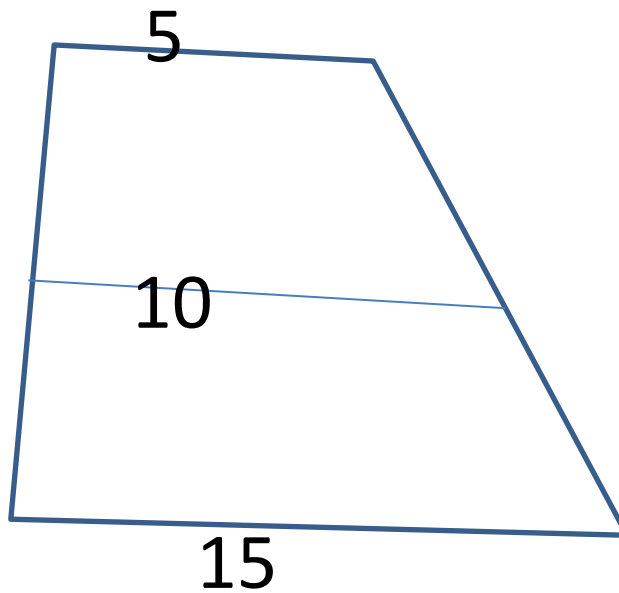
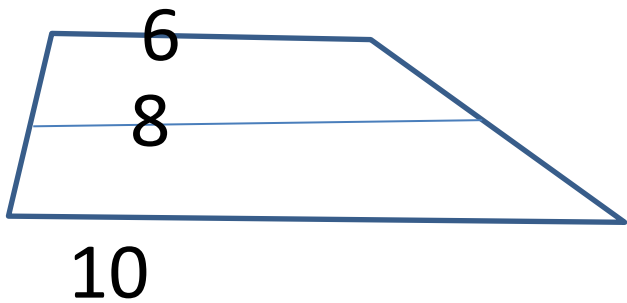


If the legs of a trapezoid are congruent, the trapezoid is an **isosceles trapezoid**. The following theorems state the properties of an isosceles trapezoid.

THEOREM	DIAGRAM	EXAMPLE
<p>6-6-3 If a quadrilateral is an isosceles trapezoid, then each pair of base angles are congruent. (isosc. trap. \rightarrow base $\angle \cong$)</p>		$\angle A \cong \angle D$ $\angle B \cong \angle C$
<p>6-6-4 If a trapezoid has one pair of congruent base angles, then the trapezoid is isosceles. (trap. with pair base $\angle \cong \rightarrow$ isosc. trap.)</p>		<p>$ABCD$ is isosceles.</p>
<p>6-6-5 A trapezoid is isosceles if and only if its diagonals are congruent. (isosc. trap. \leftrightarrow diags. \cong)</p>		$\overline{AC} \cong \overline{DB} \leftrightarrow$ <p>$ABCD$ is isosceles.</p>

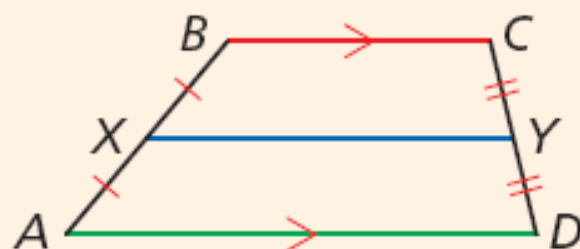
The **midsegment of a trapezoid** is the segment whose endpoints are the midpoints of the legs. In Lesson 5-1, you studied the Triangle Midsegment Theorem. The Trapezoid Midsegment Theorem is similar to it.





Theorem 6-6-6**Trapezoid Midsegment Theorem**

The midsegment of a trapezoid is parallel to each base, and its length is one half the sum of the lengths of the bases.



$$\overline{XY} \parallel \overline{BC}, \overline{XY} \parallel \overline{AD}$$

$$XY = \frac{1}{2}(BC + AD)$$

SUMMARY

Always, Sometimes, Never

1. The opposite angles of a trapezoid are supplementary.
2. The opposite angles of a kite are supplementary.
3. A pair of consecutive angles in a kite are supplementary.
4. The midsegment of a trapezoid is half the sum of the length of the bases.