

Geometry

Notes Section 8.5

Use Properties of Trapezoids and Kites

Trapezoid: _____

Bases of a Trapezoid: _____

Base Angles: _____

Legs of a Trapezoid: _____

Isosceles Trapezoid: _____

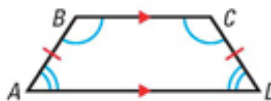
Midsegment of a Trapezoid: _____

Kite: _____

THEOREM 8.14

If a trapezoid is isosceles, then each pair of base angles is congruent.

If trapezoid $ABCD$ is isosceles, then $\angle A \cong \angle D$ and $\angle B \cong \angle C$.



THEOREM 8.15

If a trapezoid has a pair of congruent base angles, then it is an isosceles trapezoid.

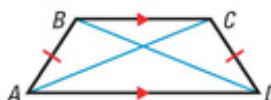
If $\angle A \cong \angle D$ (or if $\angle B \cong \angle C$), then trapezoid $ABCD$ is isosceles.



THEOREM 8.16

A trapezoid is isosceles if and only if its diagonals are congruent.

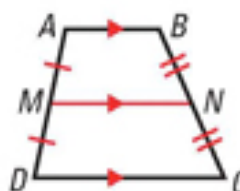
Trapezoid $ABCD$ is isosceles if and only if $\overline{AC} \cong \overline{BD}$.



THEOREM 8.17 Midsegment Theorem for Trapezoids

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

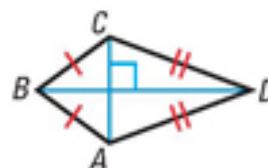
If \overline{MN} is the midsegment of trapezoid $ABCD$, then $\overline{MN} \parallel \overline{AB}$, $\overline{MN} \parallel \overline{DC}$, and $MN = \frac{1}{2}(AB + CD)$.



THEOREM 8.18

If a quadrilateral is a kite, then its diagonals are perpendicular.

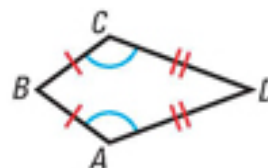
If quadrilateral $ABCD$ is a kite, then $\overline{AC} \perp \overline{BD}$.



THEOREM 8.19

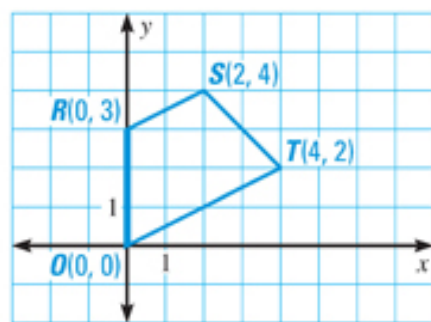
If a quadrilateral is a kite, then exactly one pair of opposite angles are congruent.

If quadrilateral $ABCD$ is a kite and $\overline{BC} \cong \overline{BA}$, then $\angle A \cong \angle C$ and $\angle B \not\cong \angle D$.



EXAMPLE 1 Show that $ORST$ is a trapezoid.

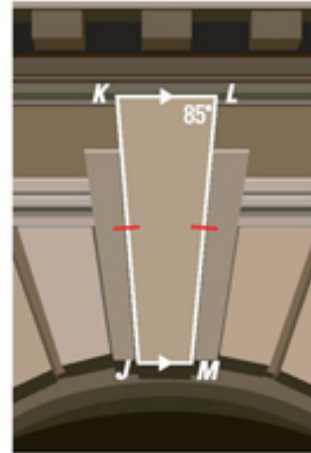
STEP 1 Show $RS \parallel OT$.



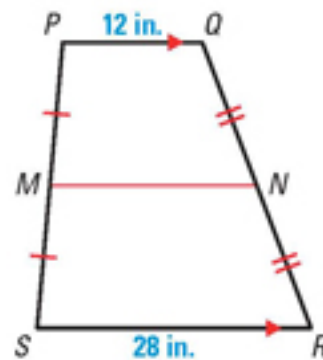
STEP 2 Show RO not parallel ST .

EXAMPLE 2 The stone above the arch in the diagram is an isosceles trapezoid.

Find $m\angle K$, $m\angle M$, and $m\angle J$.



EXAMPLE 3 MN is the midsegment of the trapezoid PQRS. Find MN.



EXAMPLE 4 Find $m\angle D$ in the kite.

