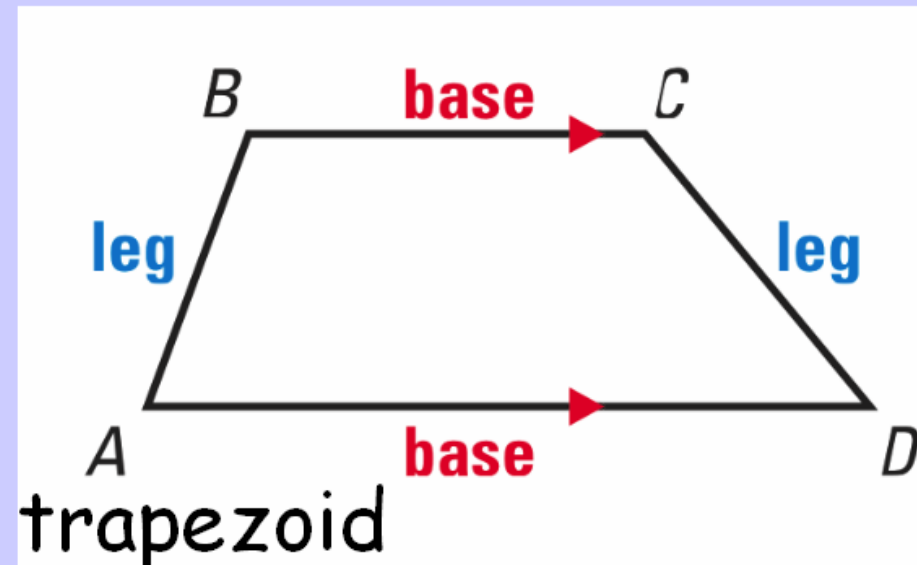


8.5 Use Properties of Trapezoids and Kites

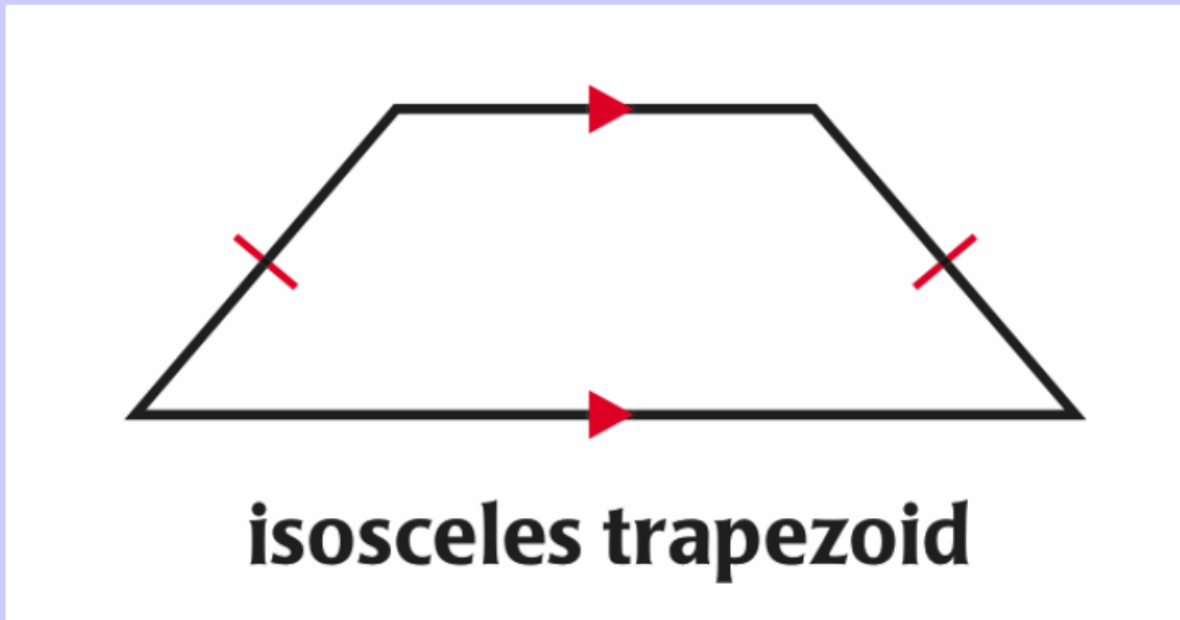
trapezoid- A quadrilateral with one pair of parallel sides

bases- The parallel sides

legs- the nonparallel sides of a trapezoid



isosceles trapezoid-Is a Trapezoid with congruent legs



THEOREMS

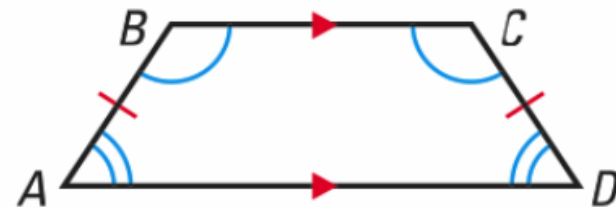
For Your Notebook

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 $\angle B \cong \angle C$.

Proof: Ex. 37, p. 548



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.

Proof: Ex. 38, p. 548

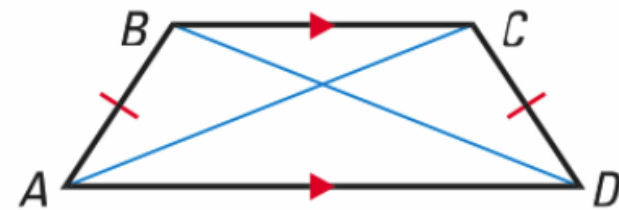


THEOREM 8.16

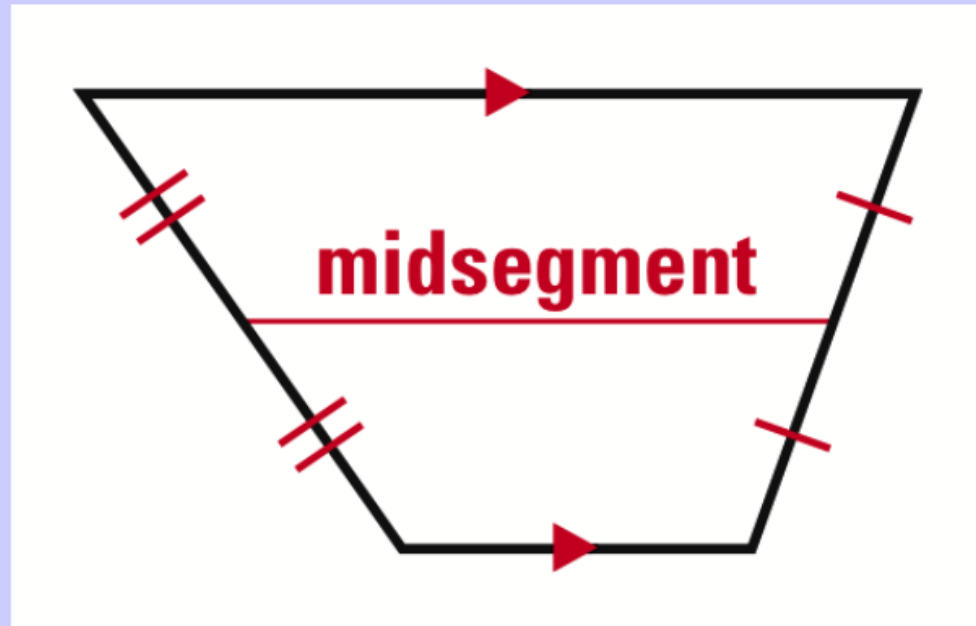
A trapezoid is isosceles if and only if its diagonals are congruent.

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

Proof: Exs. 39 and 43, p. 549



midsegment of a trapezoid-Segment
that connects the midpoints of its legs



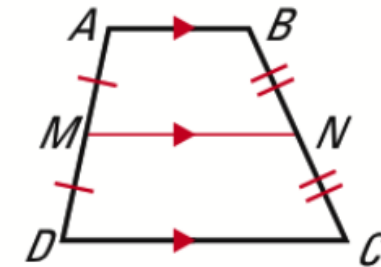
THEOREM*For Your Notebook***THEOREM 8.17** Midsegment Theorem for Trapezoids

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 $MN = \frac{1}{2}(AB + CD)$.

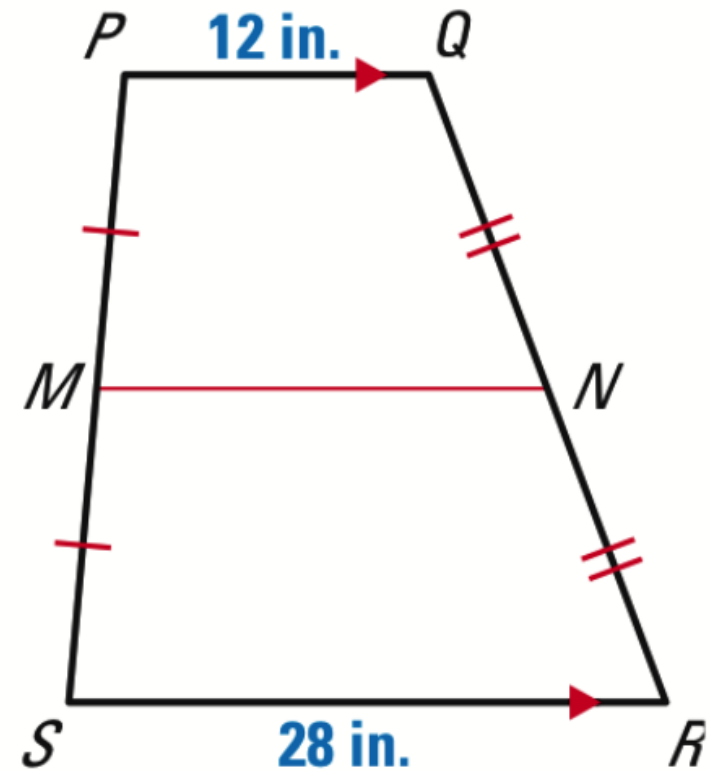
Justification: Ex. 40, p. 549

Proof: p. 937

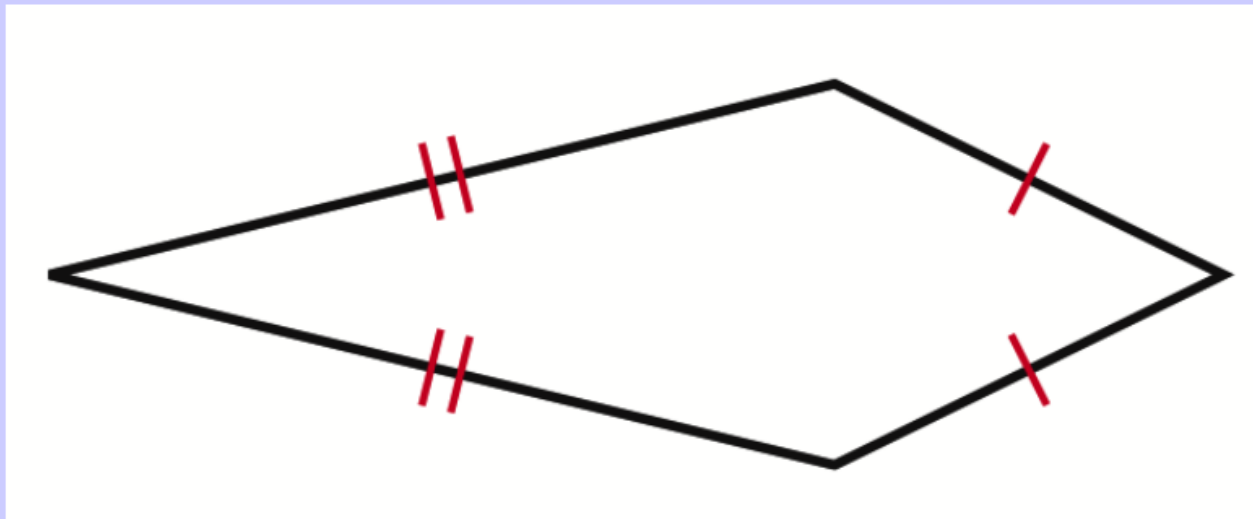


EXAMPLE 3 Use the midsegment of a trapezoid

In the diagram, \overline{MN} is the midsegment of trapezoid $PQRS$. Find MN .



kite-A quadrilateral that has two pairs of consecutive congruent sides, but opposite sides are not congruent

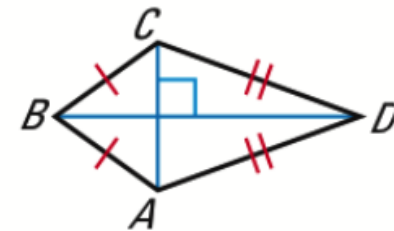


THEOREMS*For Your Notebook***THEOREM 8.18**

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

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

Proof: Ex. 41, p. 549

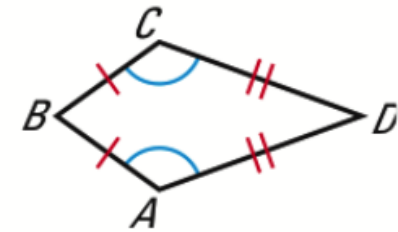


THEOREM 8.19

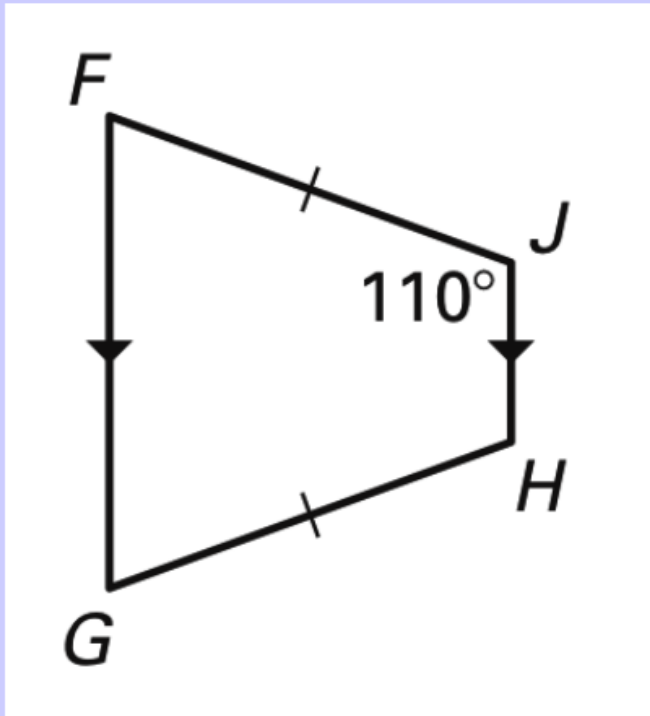
If a quadrilateral is a kite, then exactly one pair of opposite angles are congruent.

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

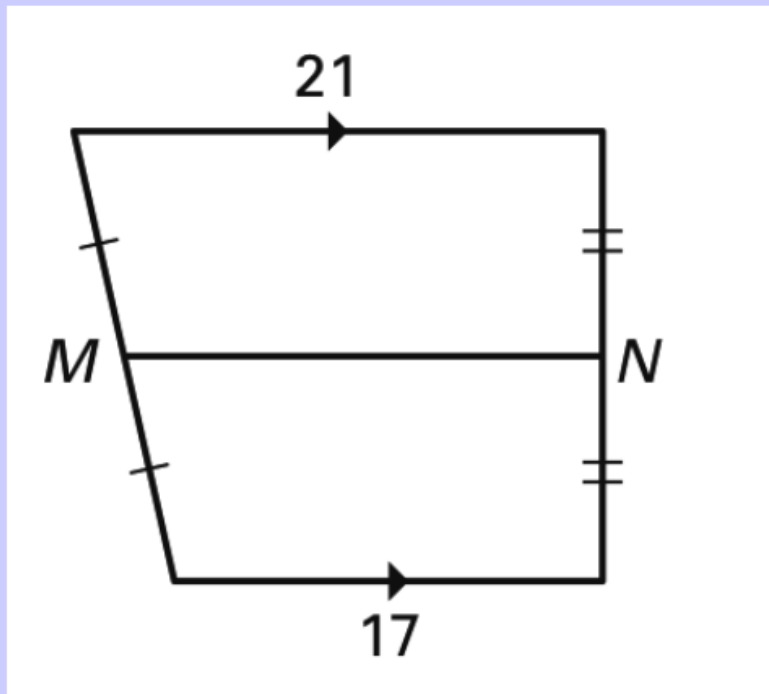
Proof: Ex. 42, p. 549



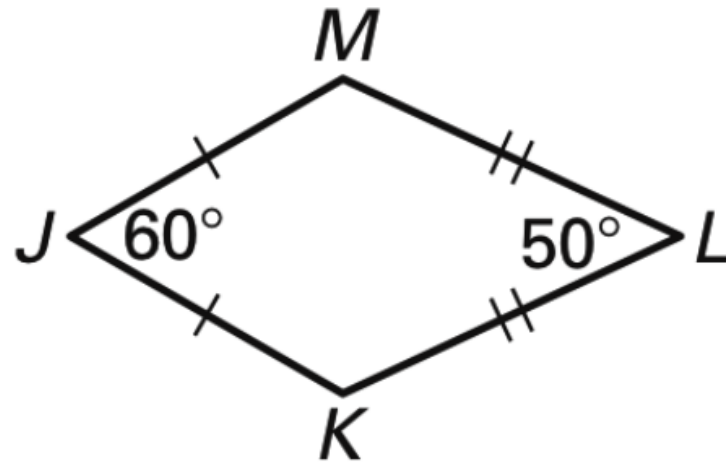
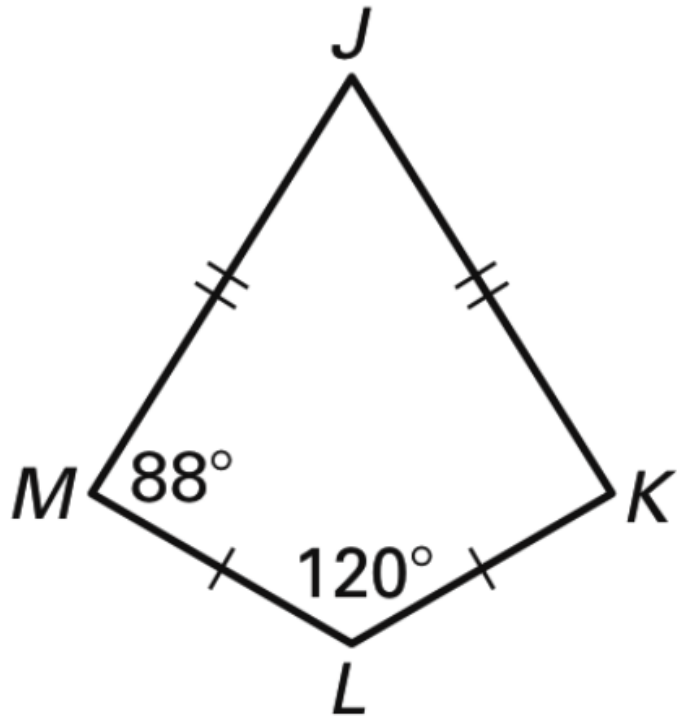
Find $m\angle F$, $m\angle G$, and $m\angle H$.



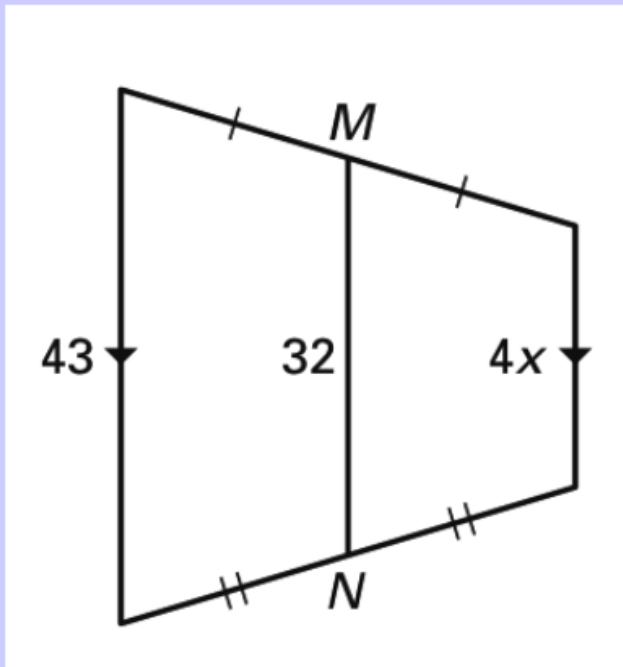
Find the length of the midsegment of the trapezoid.



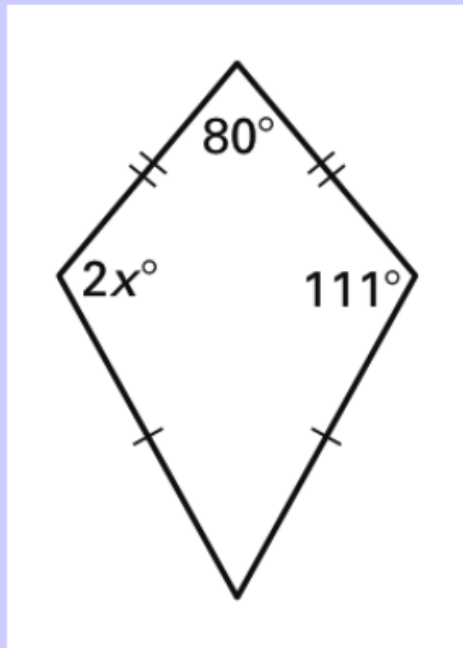
***JKLM* is a kite. Find $m\angle K$.**



Find the value of x .



Find the value of x .



Assignment:

p. 546 (7-27 all,
34)