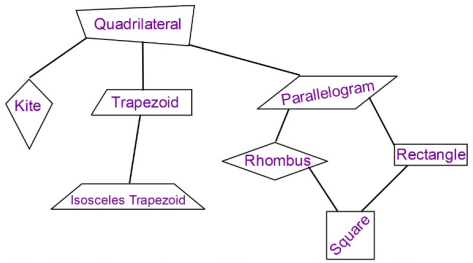
Sec 6-5: Trapezoids and Kites

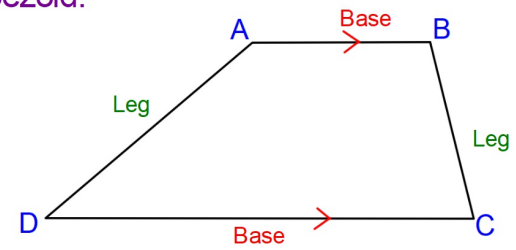
Quadrilateral Hierarchy:



Notice the Kite branch and Trapezoid branch are separate from each other which means that they are not related.

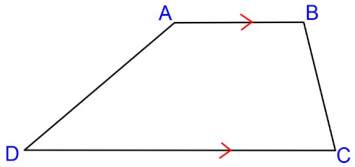
Also notice that Kites and Trapezoids are separate branches than the Parallelograms.

ABCD is a Trapezoid:



The bases of a trapezoid are The parallel sides

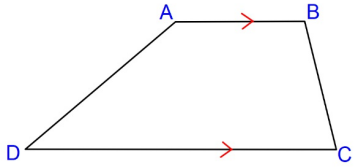
The legs of a trapezoid are The non-parallel sides



$\angle A$ & $\angle D$ are supplementary (same-side int $\angle' s$)

$\angle B$ & $\angle C$ are supplementary (same-side int $\angle' s$)

In a trapezoid angles that share a leg are supplementary



$\angle A$ & $\angle B$ are called base angles

$\angle C$ & $\angle D$ are called base angles

Base angles are angles that share a base.

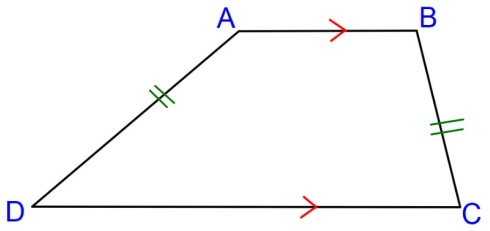
Quadrilateral Booklet

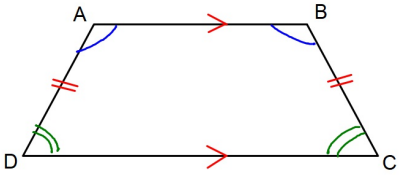
Trapezoid	Proving a Quad is a Trapezoid:
Def: Quad with exactly one pair of parallel sides. Angles that share a leg are supplementary	Show it has only one pair of parallel sides. To show this you need to show that only one pair of sides has the same slope.

Isosceles Trapezoid

Trapezoid whose legs are congruent.

In trapezoid ABCD, AD ≅ BC

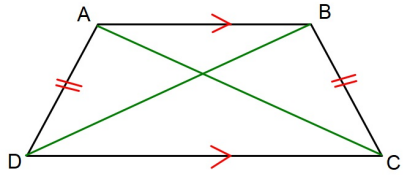




Theorem 6-15

The base angles of an isosceles trapezoid are congruent.

base angles are the angles that share a base.



Theorem 6-16

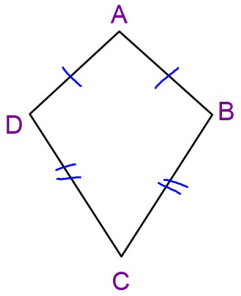
The diagonals of an isosceles trapezoid are congruent.

AC≅BD

Quadrilateral Booklet

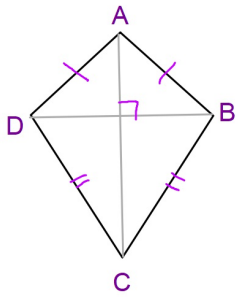
Isosceles Trapezoid	Proving a Quad is an Isosceles Trapezoid:
Def: Trapezoid with ≅ legs.	1. Show it's a Trapezoid and non-‖ sides are ≅ (distance formula)
Both pair of base angles are ≅	2. Show it's a Trapezoid and diagonals are ≅ (distance formula)
Diagonals are ≅	3. Show it's a Trapezoid and both pair of base angles are ≅

Kite:
Quadrilateral with two pair of adjacent sides ≅ but no opp sides ≅

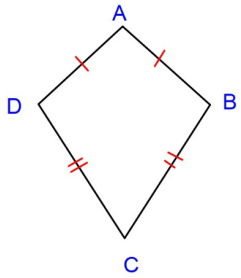


Theorem 6-17

The diagonals of a kite are perpendicular.



Given Kite ABCD:



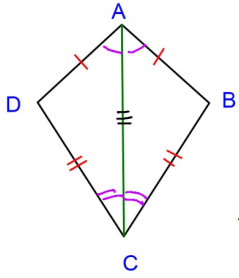
Draw diagonal $\overline{AC}$.

What does this diagonal create? ≅Δ's

ΔABC≅ΔADC Reason: SSS

What is true about angles D and B? Why?

They are ≅ Reason: CPCTC



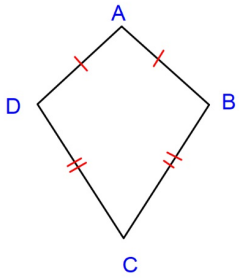
What happened to angles A and C? The were bisected.

Reason: CPCTC

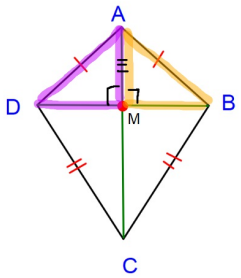
Are angles A and C ≅? Why?

No, if both pair of opp angles are congruent the quad would be a Parallelogram!

Given Kite ABCD:



Draw both diagonals. Label their intersection pt. M.



What is true about ΔABM and ΔADM?

Congruent

Reason: HL

What does this mean about diagonal $\overline{DB}$?

It got bisected.

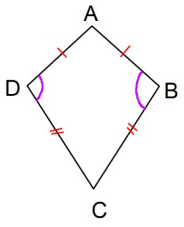
$\overline{MD} \cong \overline{MB}$ CPCTC

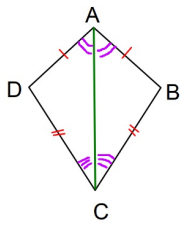
Did diagonal $\overline{AC}$ get bisected?

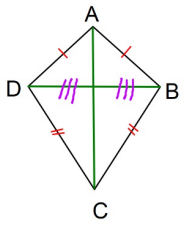
No, if both diagonals got bisected then this quad would be a Parallelogram!

In a kite:

- one pair of opposite angles are ≅
- the non-congruent angles are bisected
- one of the diagonals is bisected







Quadrilateral Booklet

Kite	Proving a Quad is Kite:
Def: Quad with 2 pair adjacent ≅ sides. No opp sides are ≅ Diagonals are ⊥ One pair of opp angles ≅ One diagonal bisects two angles. One diagonal is bisected	Show 2 pair of adjacent sides are ≅ but no opp sides ≅ (distance formula)

You can now finish Hwk #7: Sec 6-5

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Problems 2, 9, 10, 13, 14, 17, 18, 26, 28