Special Quadrilaterals

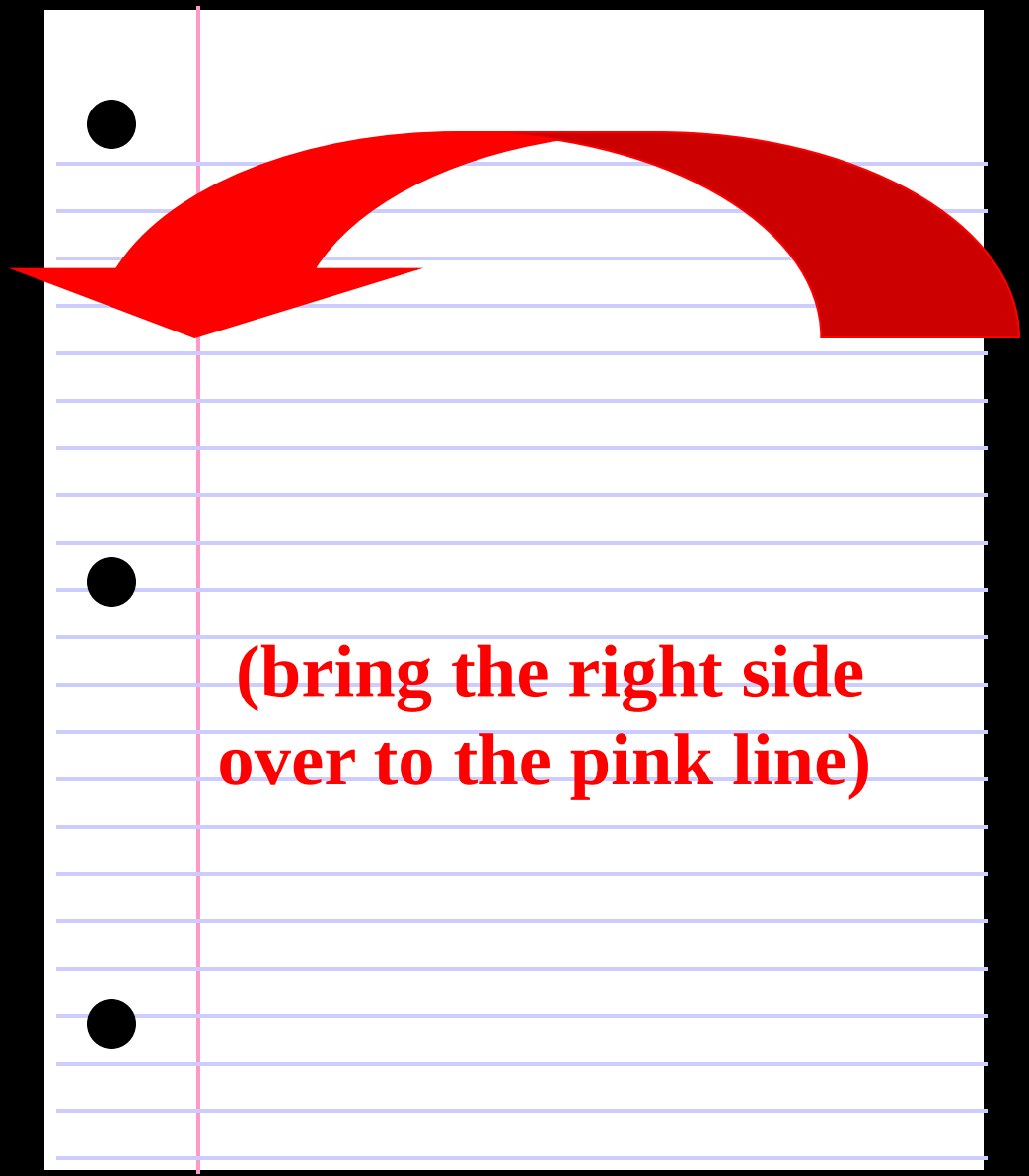
Ch 5, sections 4 – 7

Quadrilateral

Four sided polygon

Foldable

1. **Take out a piece of notebook paper and make a hot dog fold.**

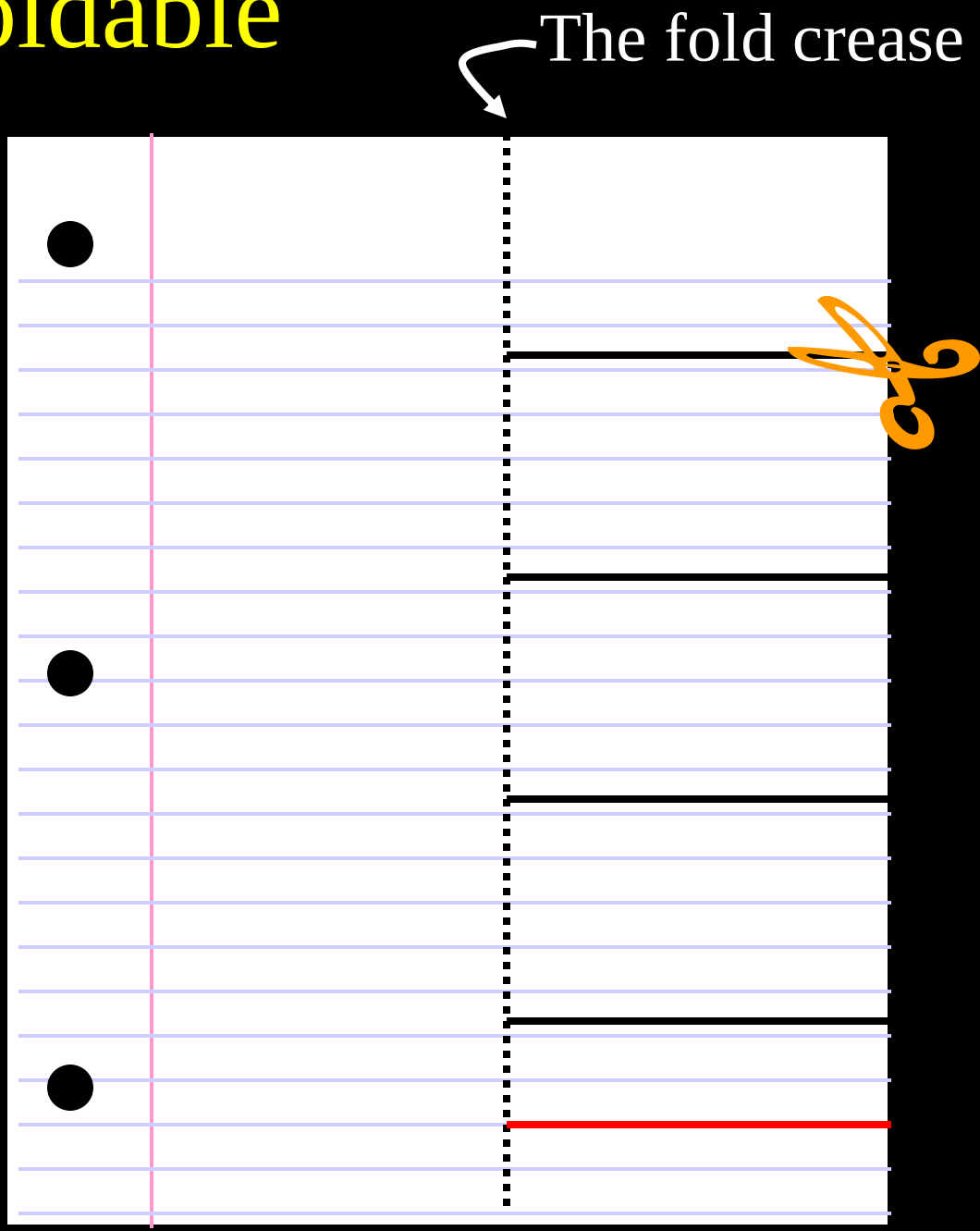


Foldable

2. **Now, open back up and divide the right hand section into 5 sections by drawing 4 evenly spaced lines.**

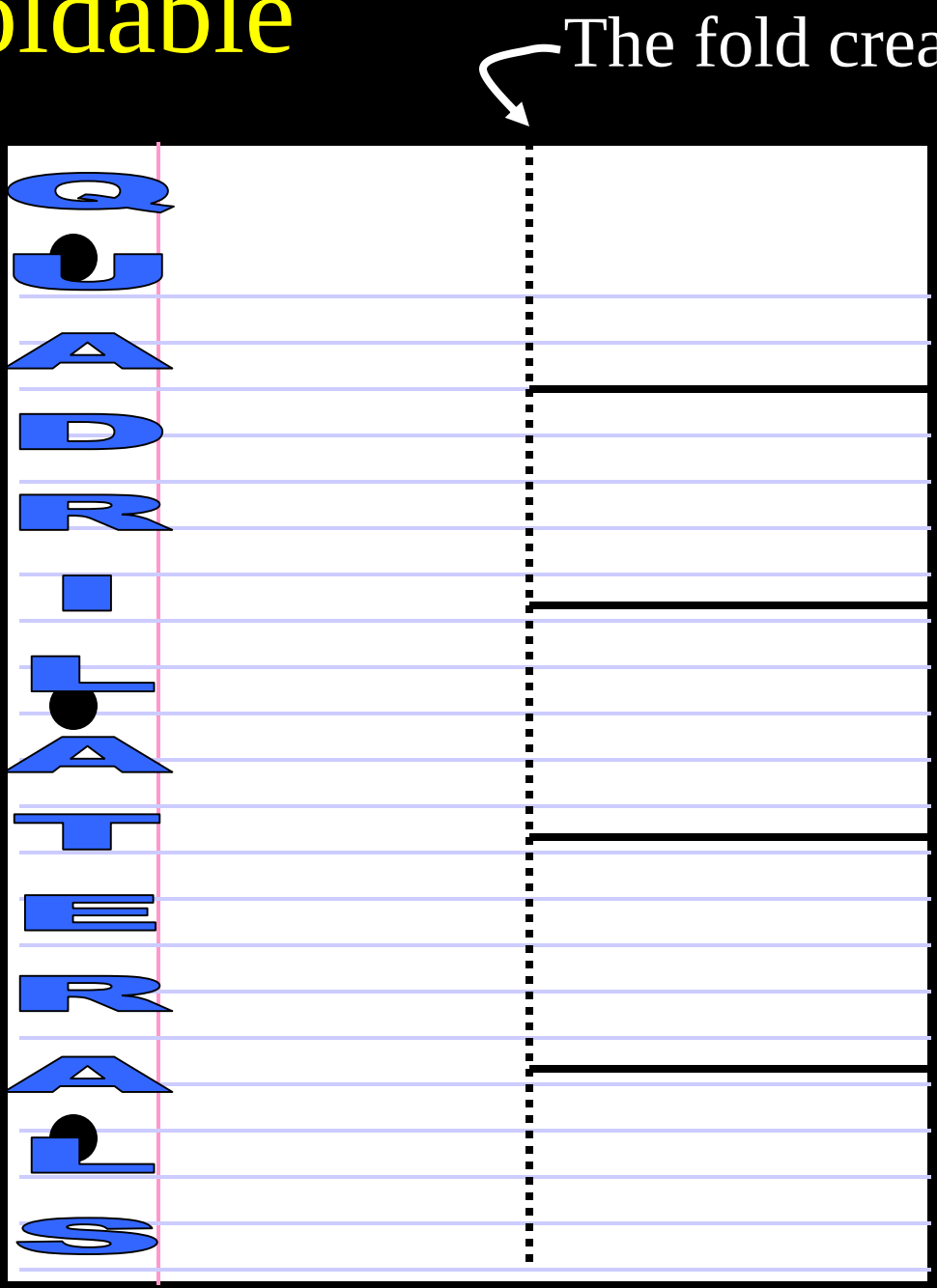
3. **Use scissors to cut along your drawn lines, but ONLY to the crease!**

4. **Draw one more line that divides the fifth flap into two sections.**



Foldable

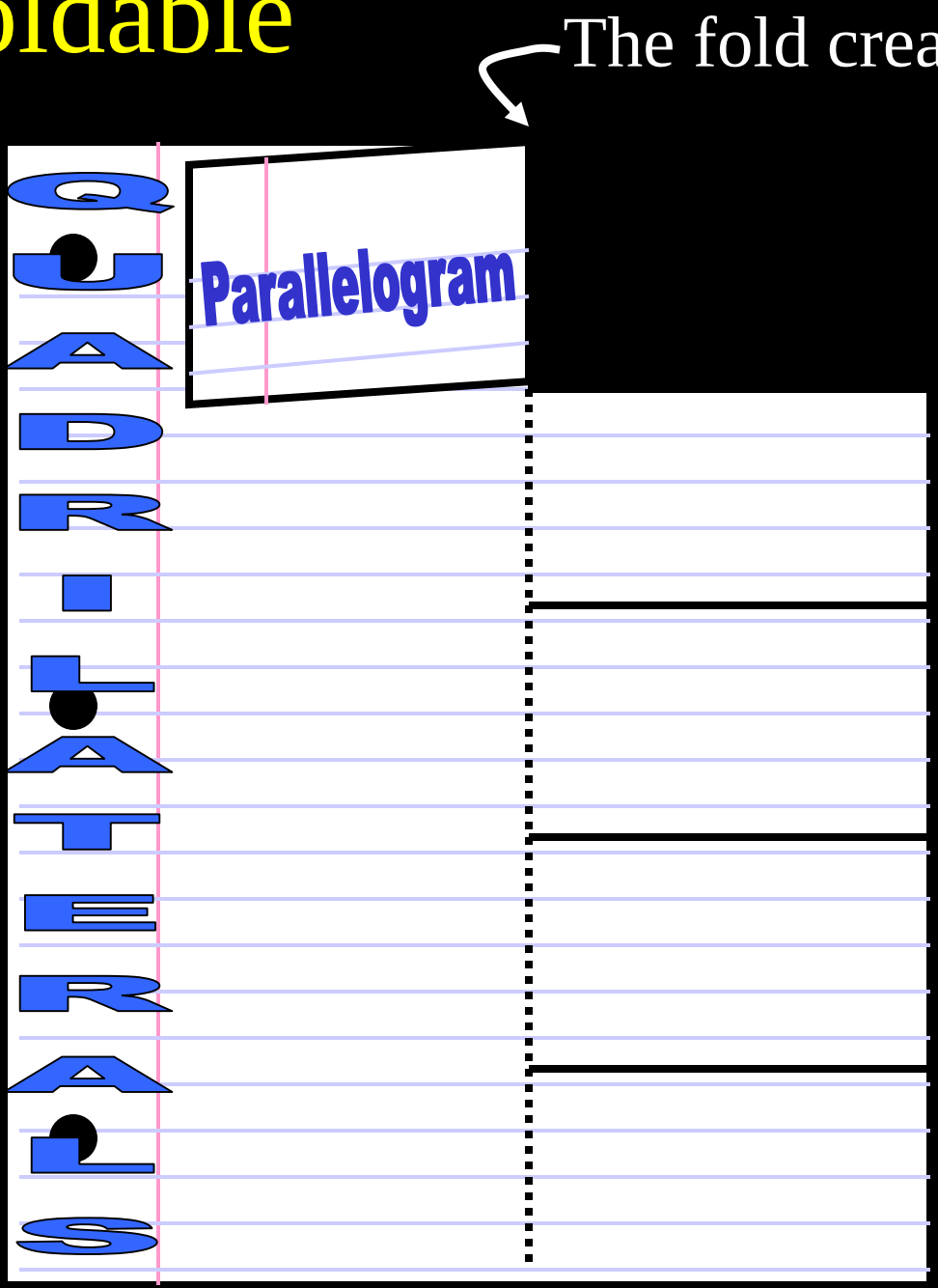
4. Write
QUADRILATERALS
down the left hand side



Foldable

5. Fold over the top cut section and write PARALLELOGRAM on the outside.

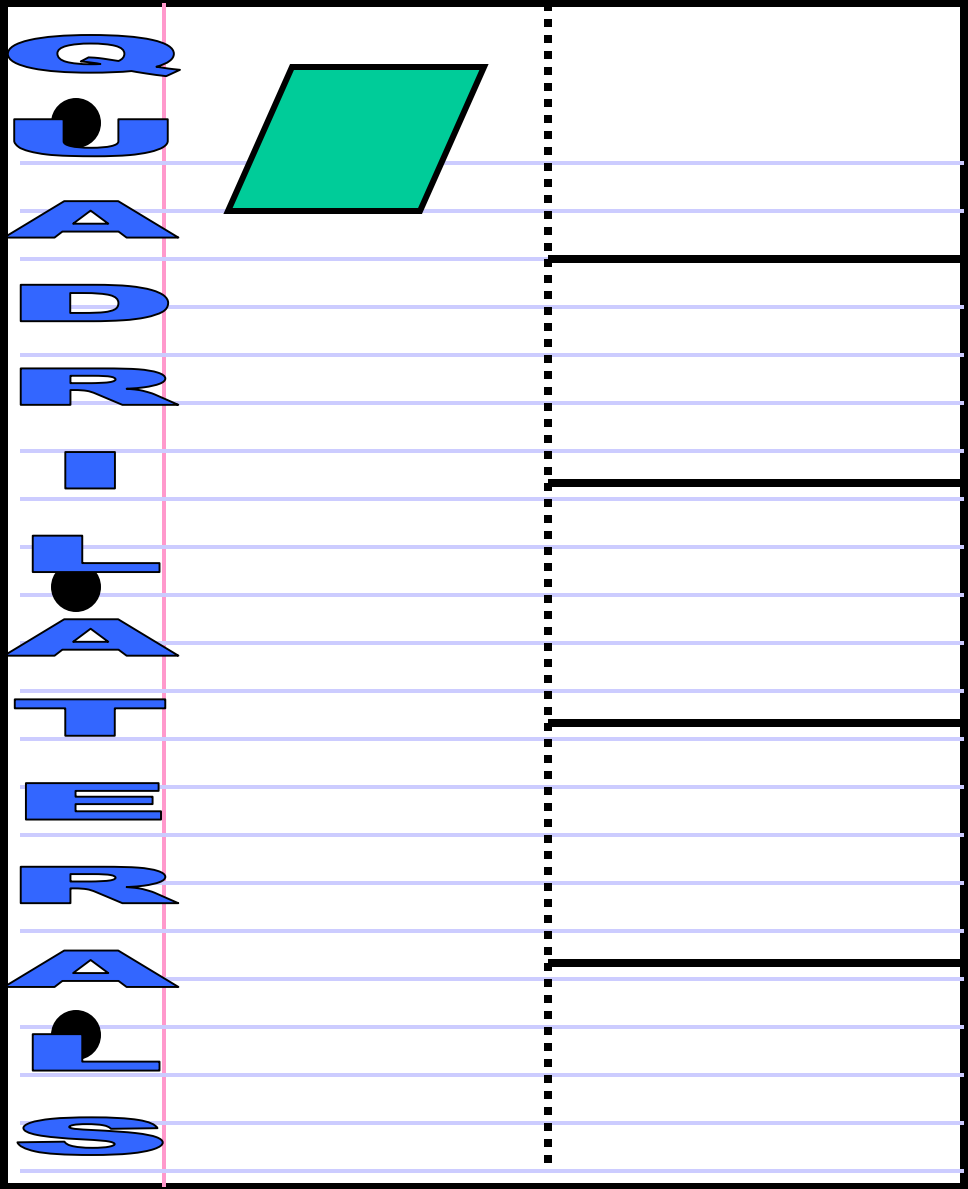
6. Reopen the fold.



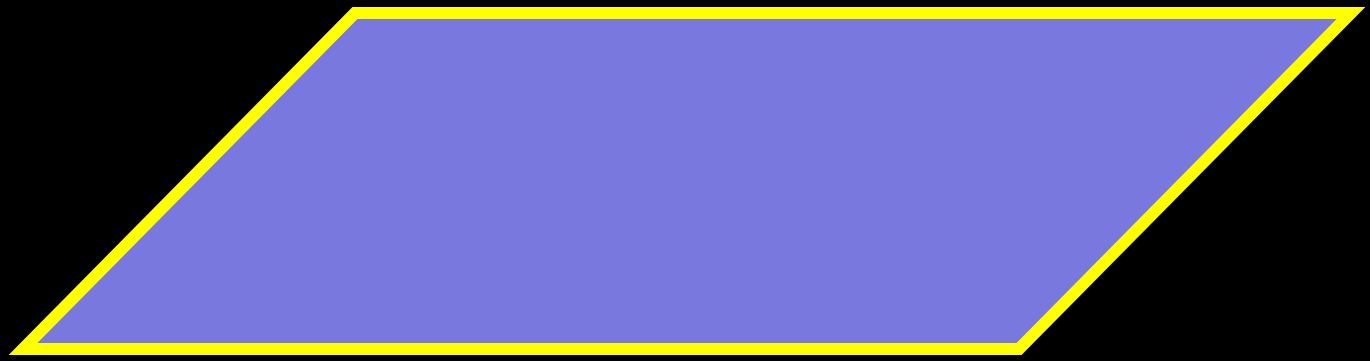
Foldable

7. On the left hand section, draw a parallelogram.

8. On the right hand side, list all of the properties of a parallelogram.



Parallelograms



Now, let's review what we've previously learned!

A quadrilateral is a **PARALLELOGRAM** if and only if it has two sets of parallel sides

Properties

1. BOTH pairs of opposite sides are parallel

2. BOTH pairs of opposite sides are congruent

3. BOTH pairs of opposite angles are congruent

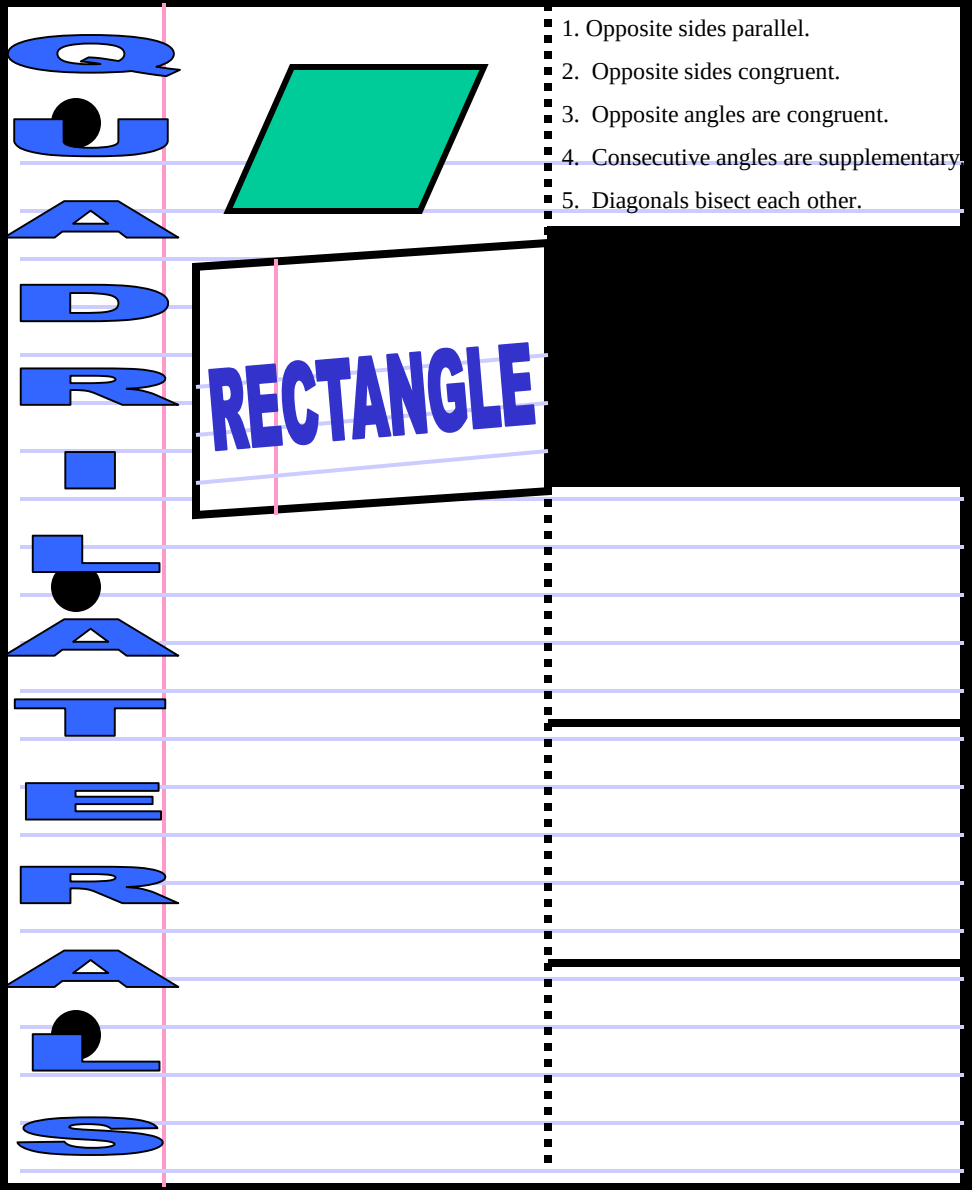
4. Consecutive angles are supplementary

5. Diagonals BISECT each other

Foldable

* **Fold over the second cut section and write RECTANGLE on the outside.**

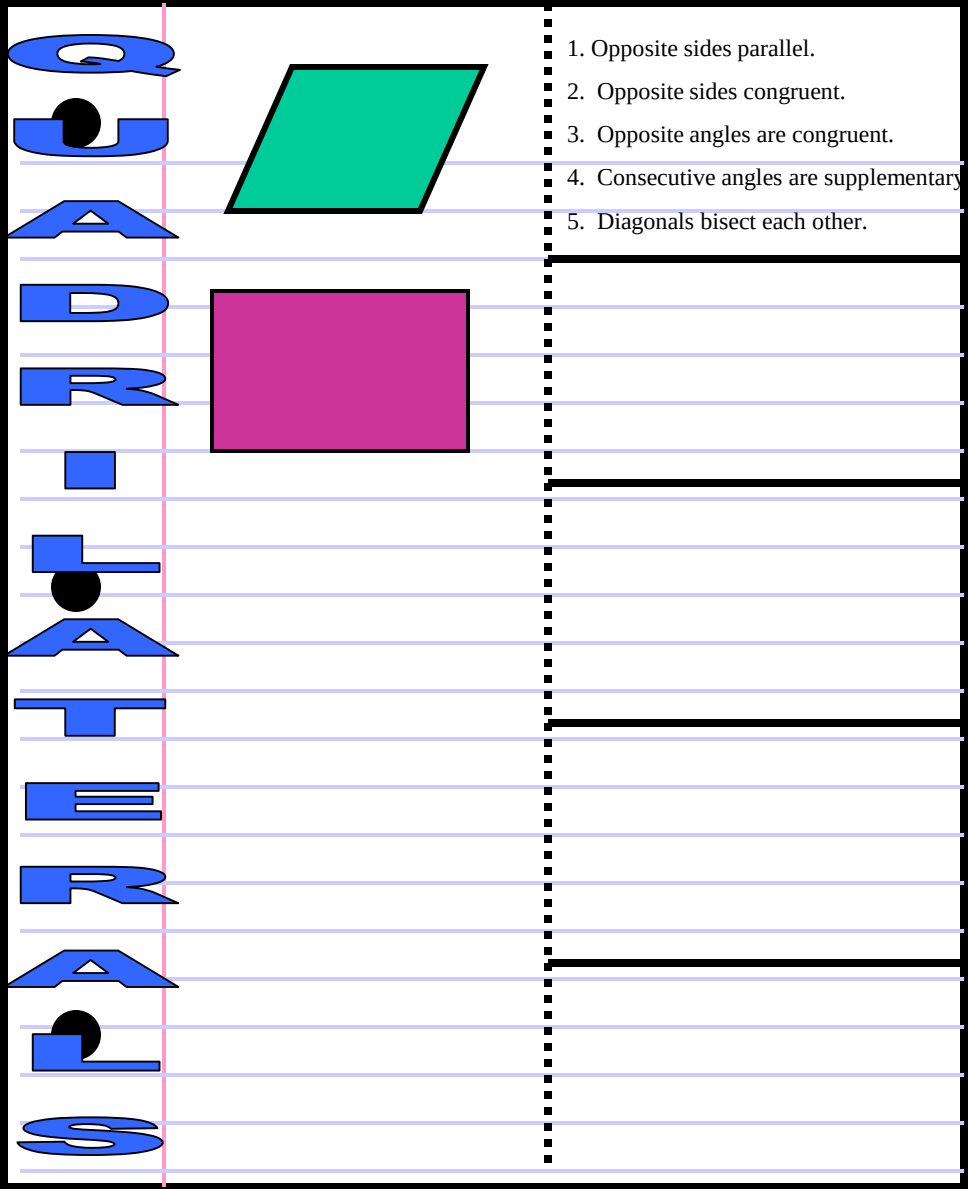
* **Reopen the fold.**



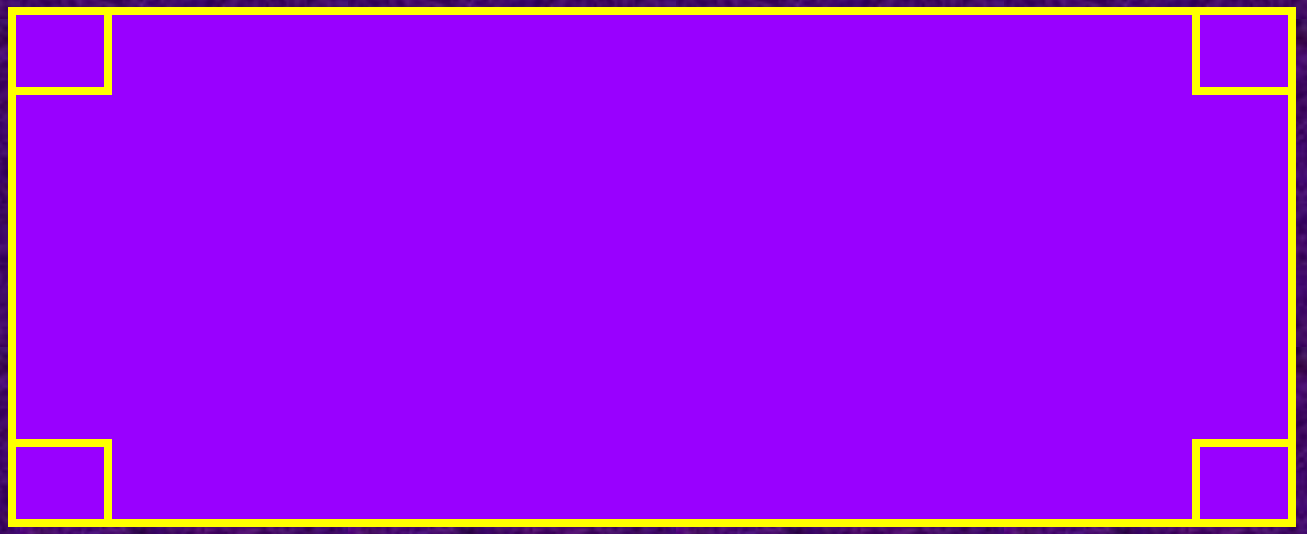
Foldable

*** On the left hand section, draw a rectangle.**

*** On the right hand side, list all of the properties of a rectangle.**



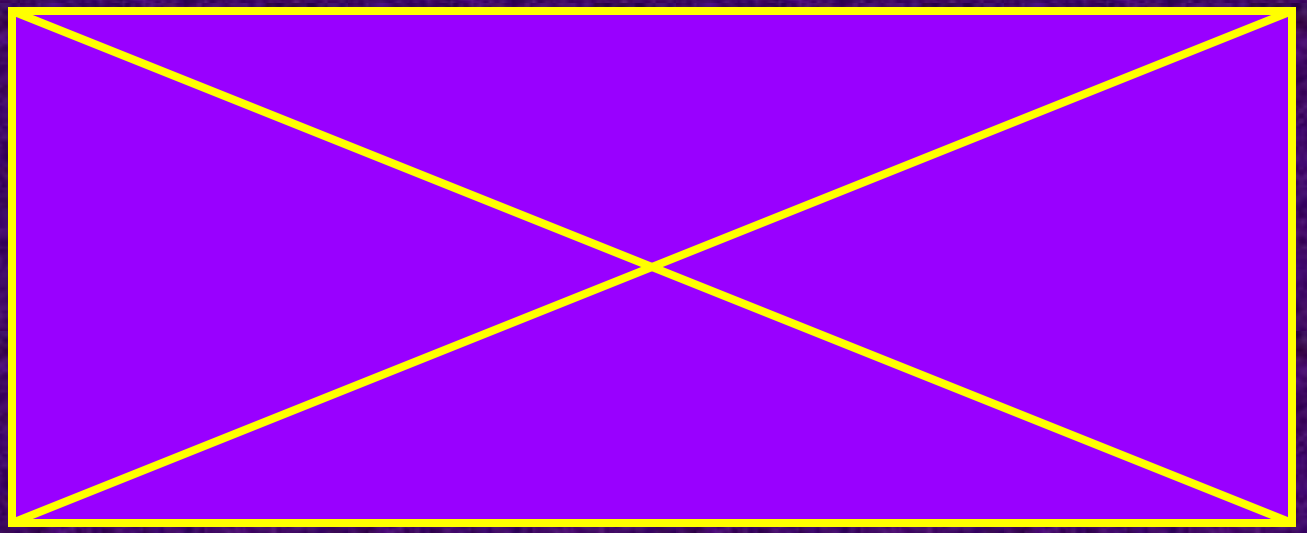
RECTANGLE



A parallelogram with
FOUR RIGHT ANGLES

A quadrilateral is a RECTANGLE if and only if it has four right angles.

RECTANGLE

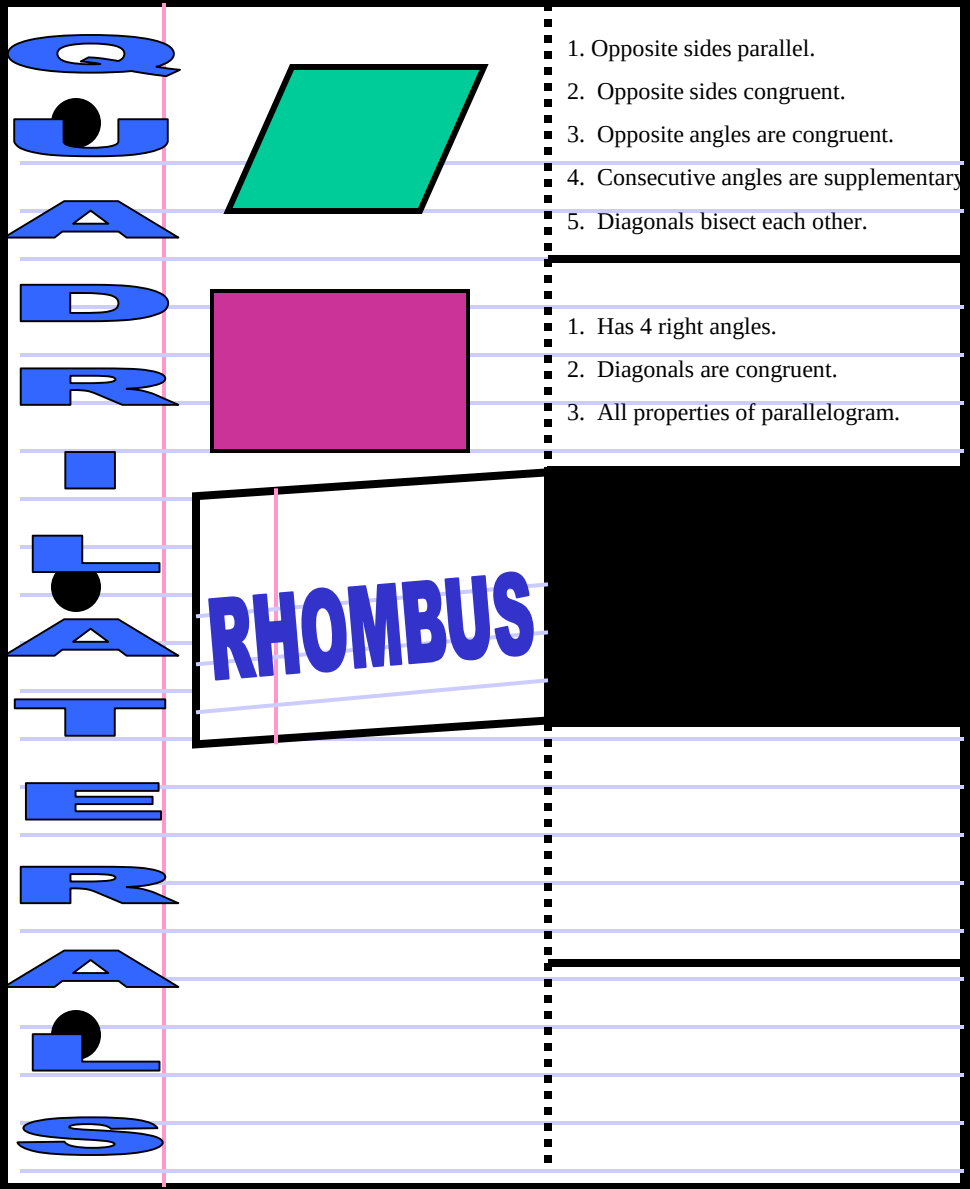


Diagonals are Congruent

Foldable

*** Fold over the third cut section and write RHOMBUS on the outside.**

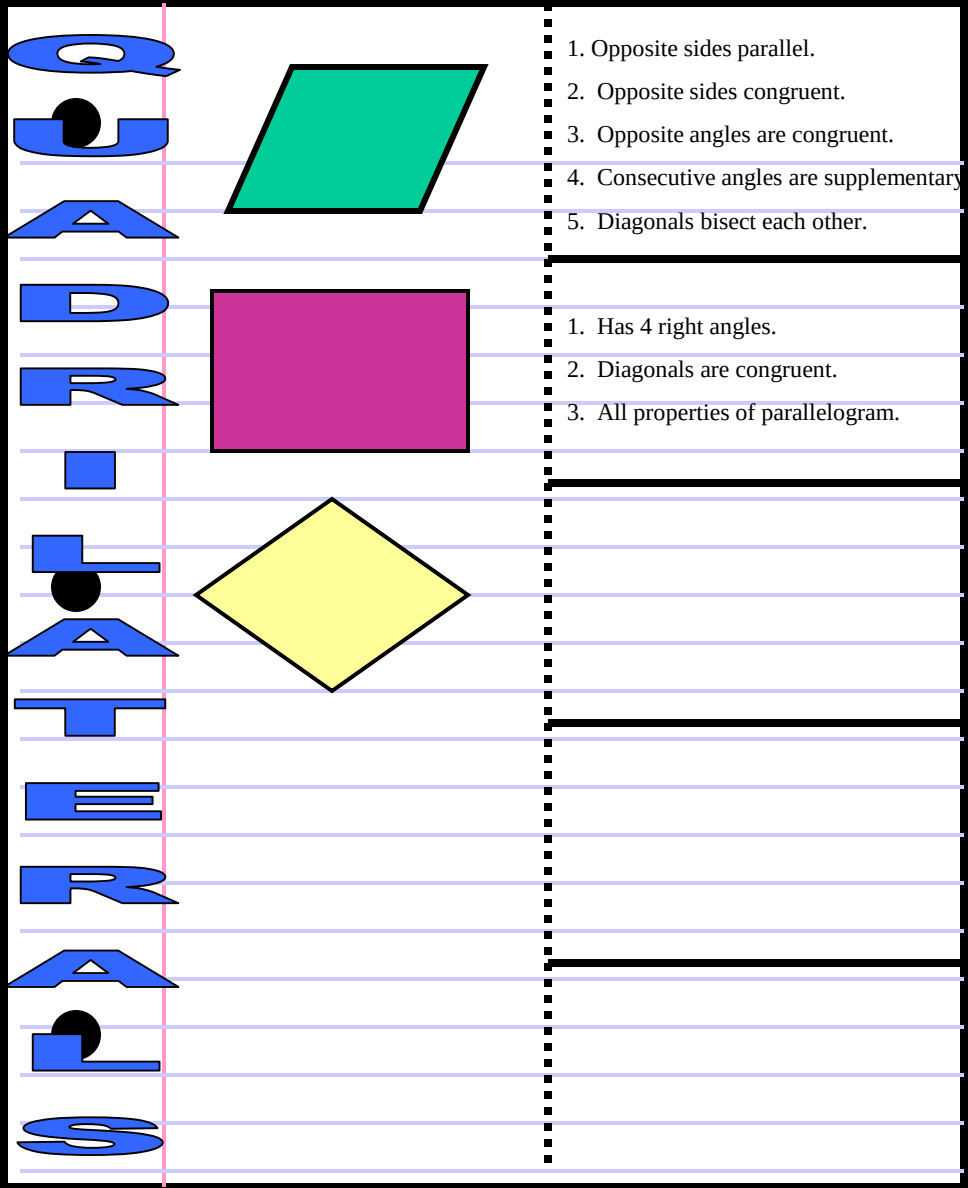
*** Reopen the fold.**



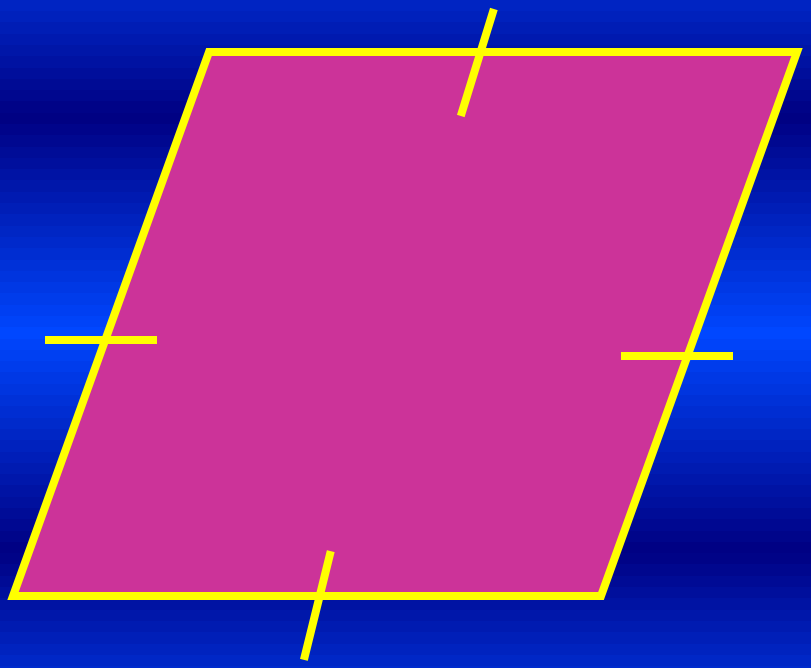
Foldable

*** On the left hand section, draw a rhombus.**

*** On the right hand side, list all of the properties of a rhombus.**



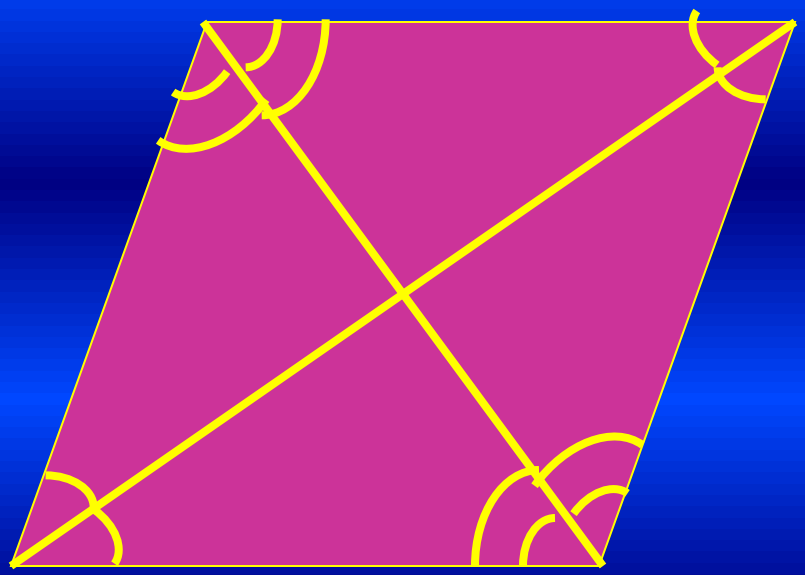
RHOMBUS



A parallelogram with FOUR CONGRUENT SIDES

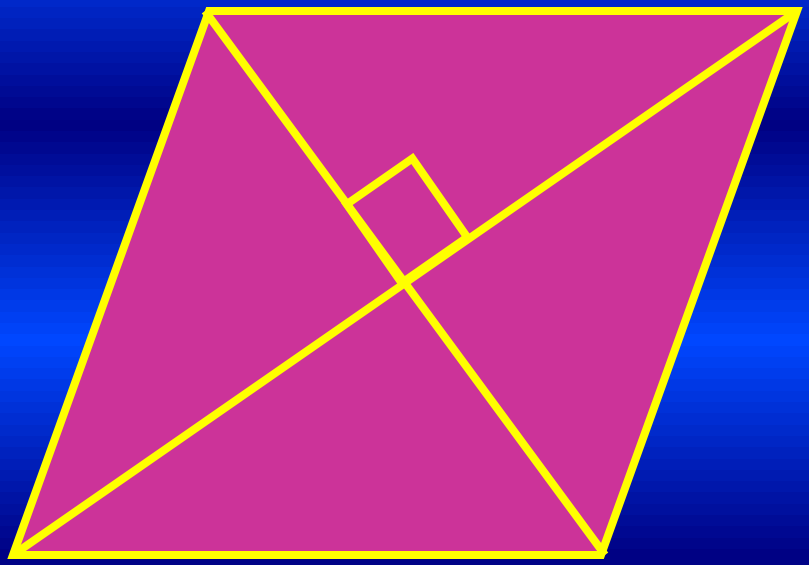
A quadrilateral is a RHOMBUS if and only if it has four congruent sides

RHOMBUS



Diagonals Bisect A Pair of Opposite Angles

RHOMBUS

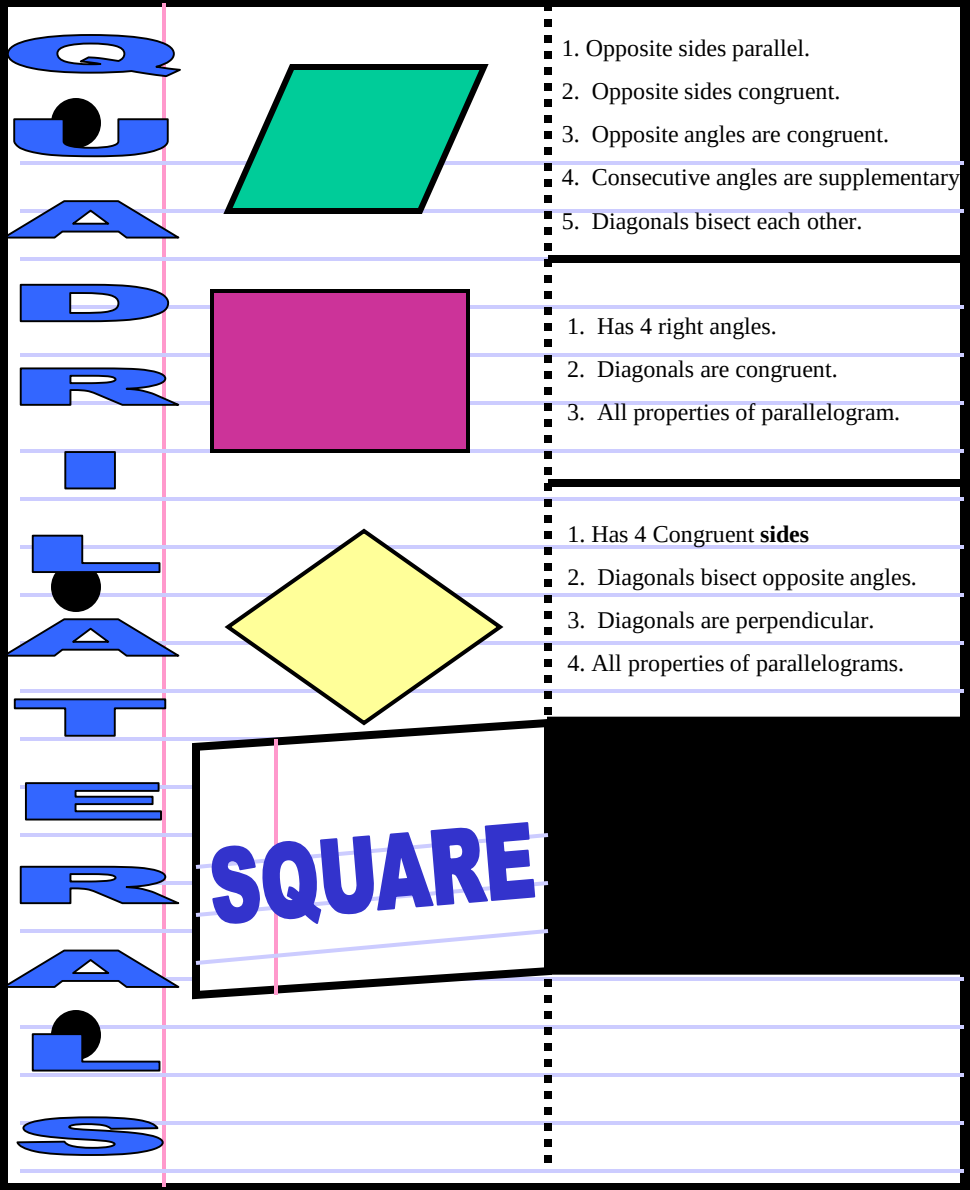


Diagonals are Perpendicular

Foldable

*** Fold over the fourth cut section and write SQUARE on the outside.**

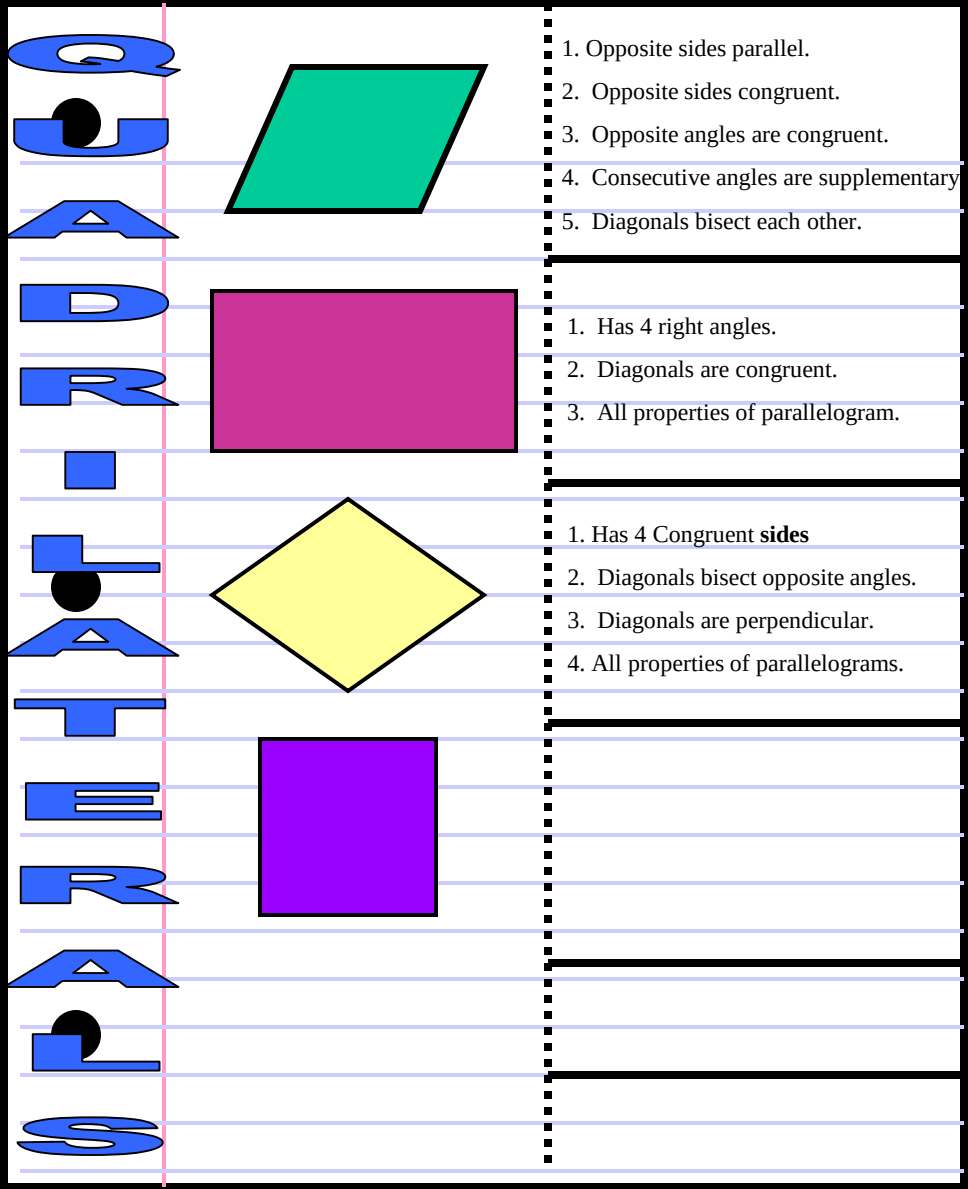
*** Reopen the fold.**



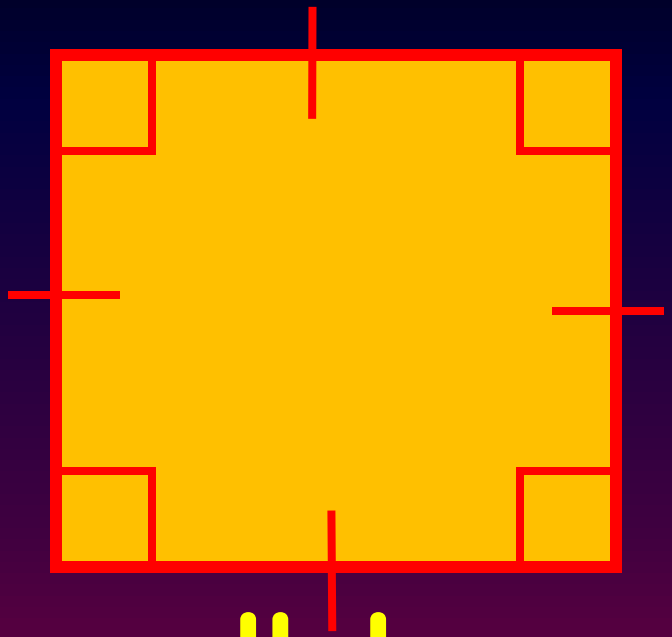
Foldable

*** On the left hand section, draw a square.**

*** On the right hand side, list all of the properties of a square.**



SQUARE

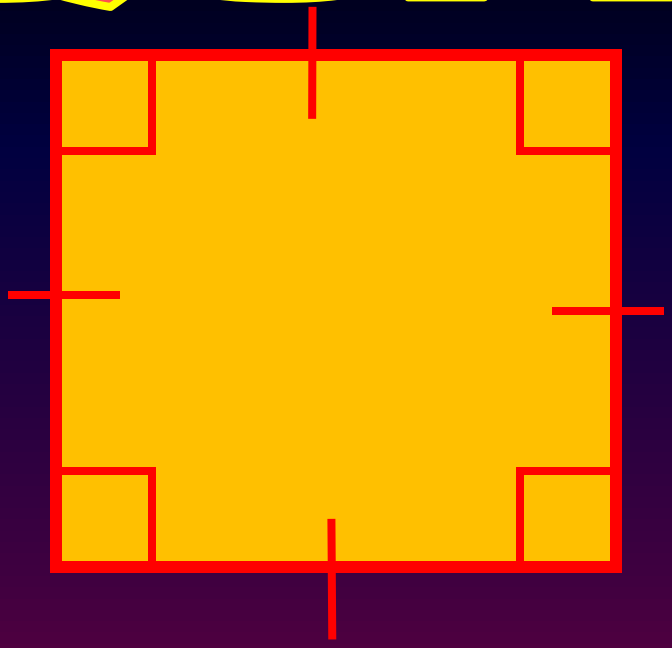


A parallelogram with
FOUR RIGHT ANGLES
AND
FOUR CONGRUENT SIDES

A quadrilateral is a SQUARE if and only if it has:

four congruent sides *and* four right angles

SQUARE

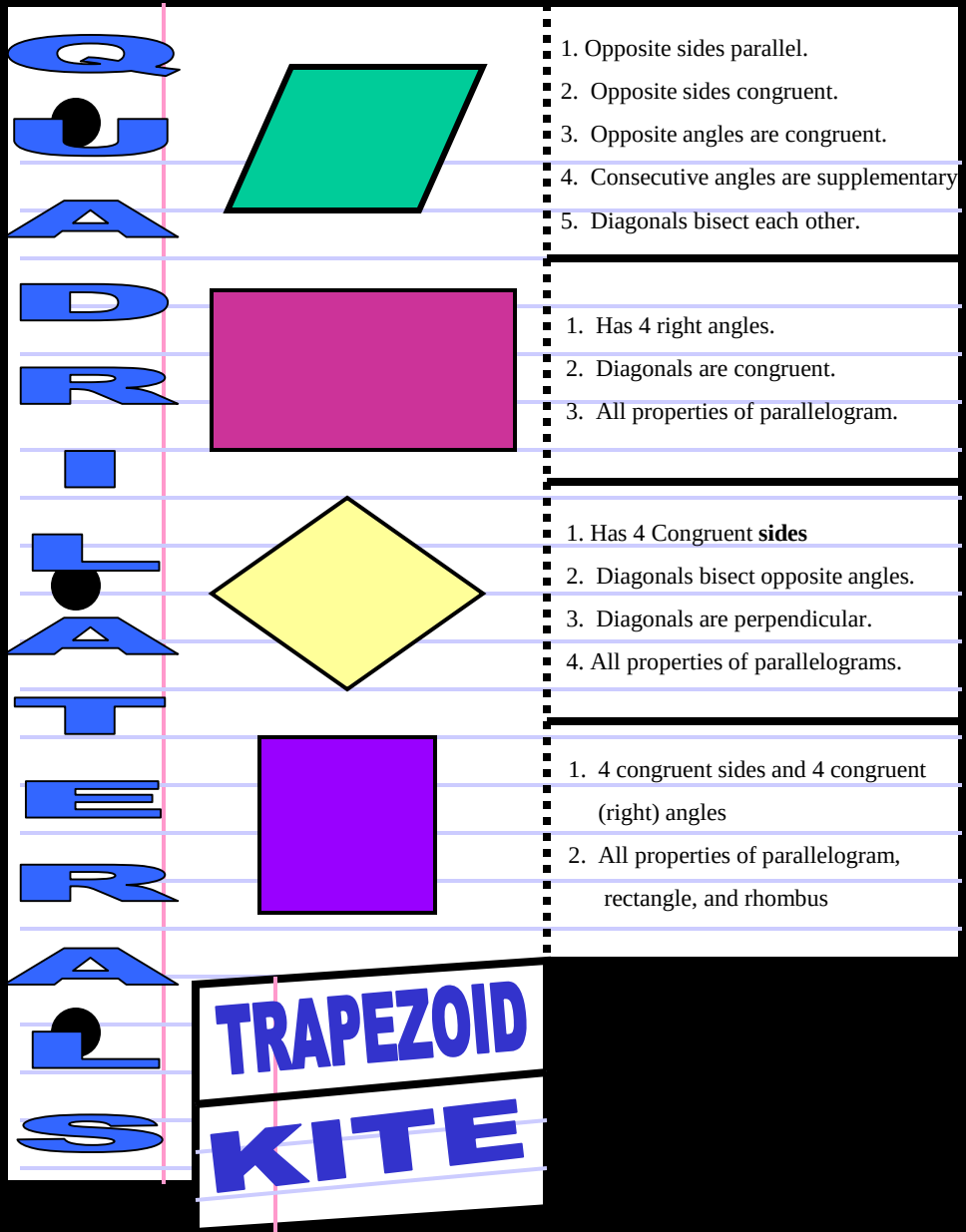


Possesses the same properties as Rhombus *and* Rectangle

Foldable

*** Fold over the fifth cut section and write Trapezoid on top and Kite underneath on the outside.**

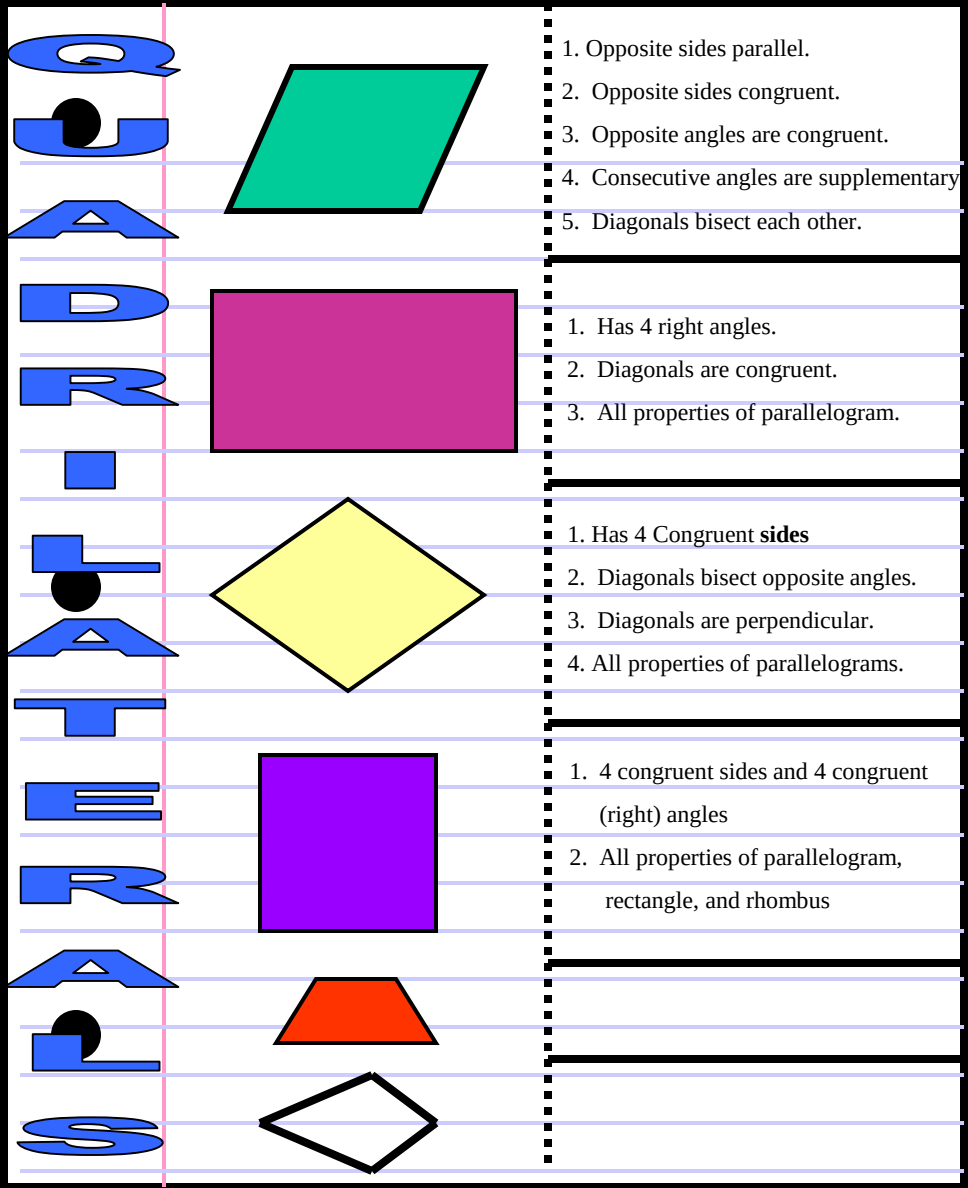
*** Reopen the fold.**



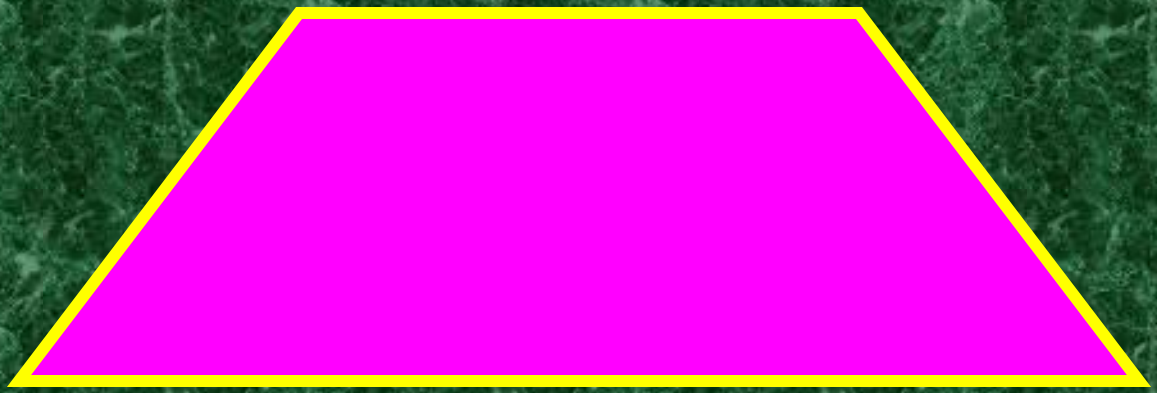
Foldable

*** On the left hand section, draw a trapezoid, then a kite underneath it.**

*** On the right hand side on top, list all of the properties of a trapezoid, then repeat the process with kites underneath.**



Trapezoid

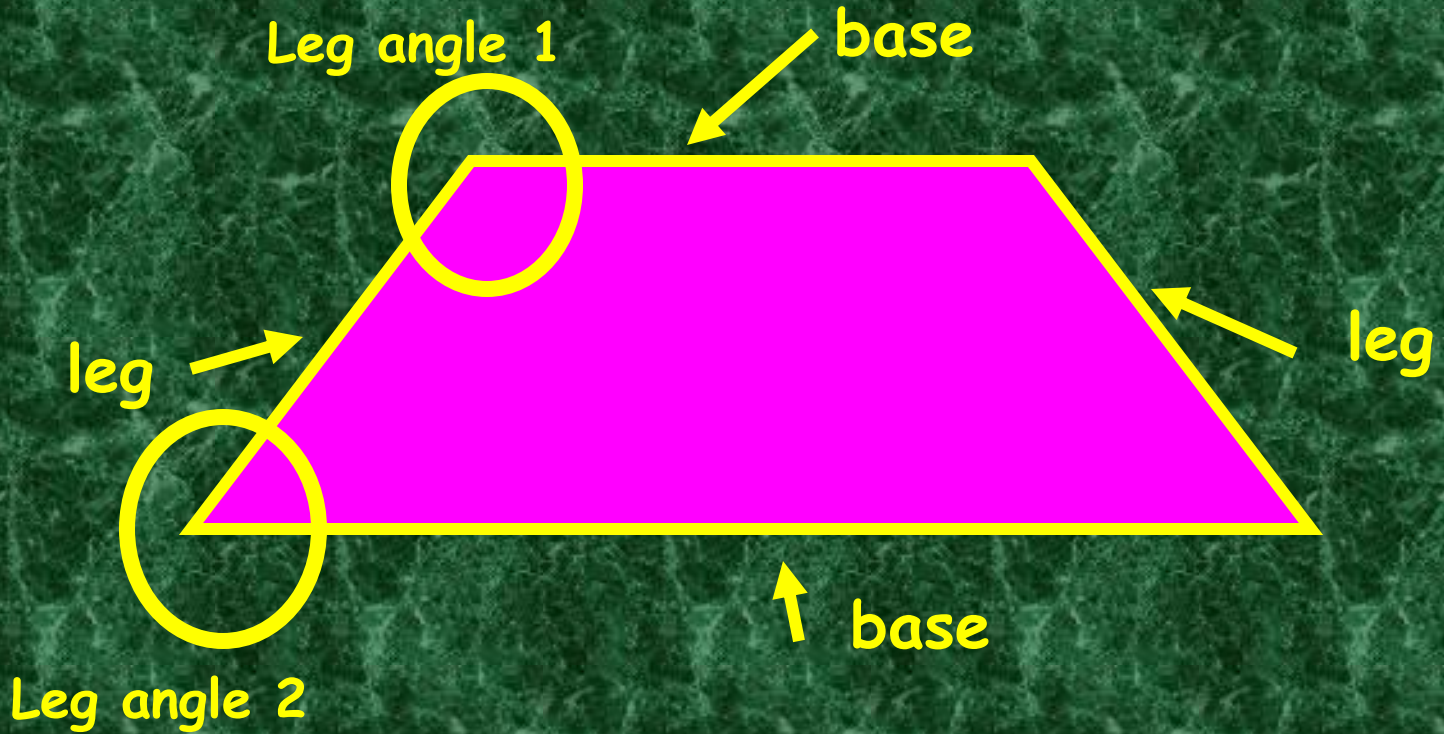


ONE PAIR OF PARALLEL SIDES

A quadrilateral is a TRAPEZOID if and only if it has:

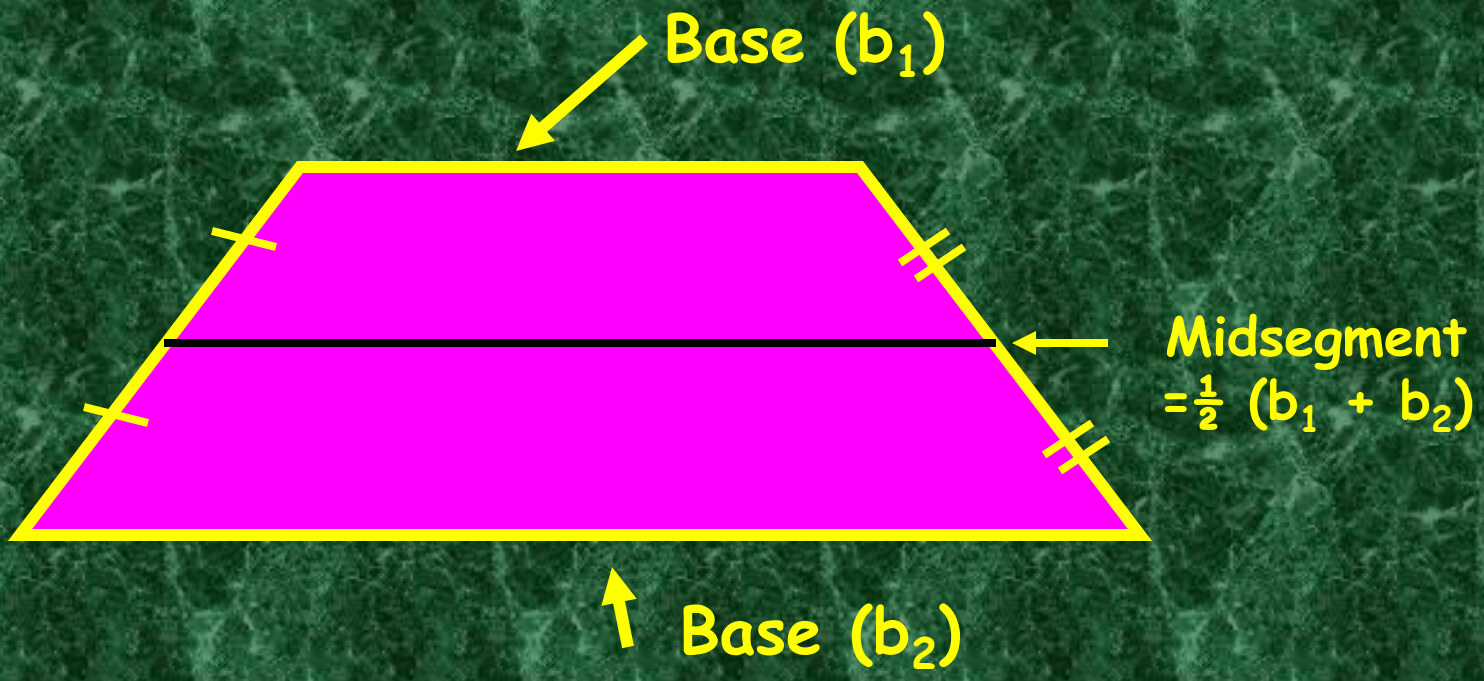
Exactly ONE pair of parallel sides, called bases.

Trapezoid



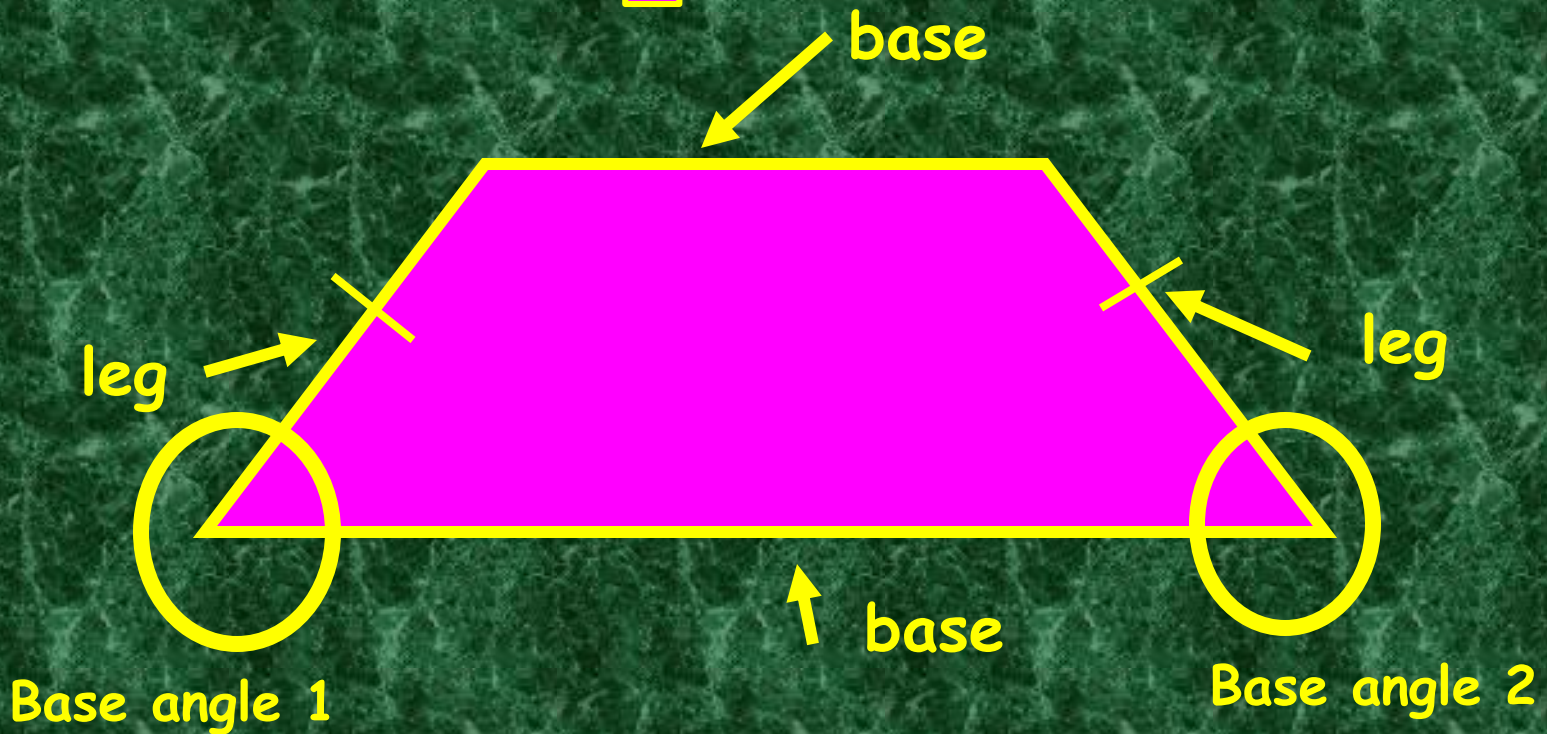
Leg angles are supplementary

Trapezoid



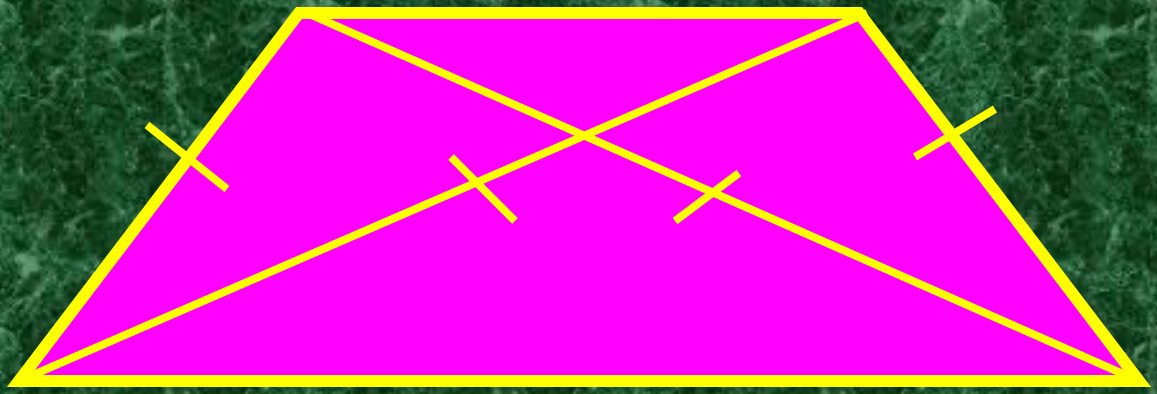
Midsegment is $\frac{1}{2}$ the sum of the lengths of the bases

Trapezoid



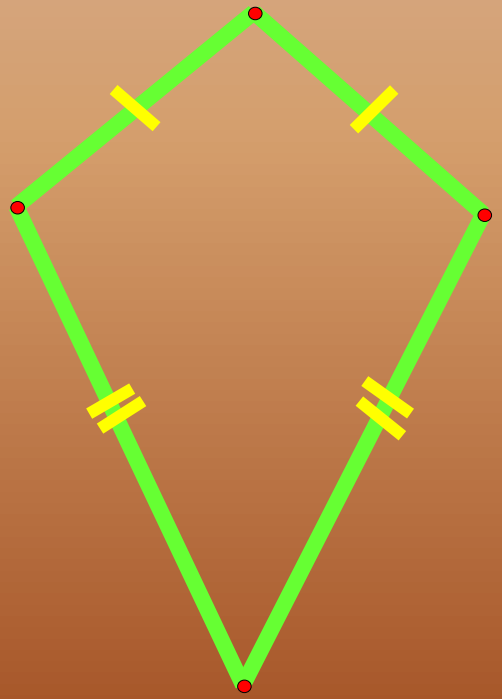
Isosceles:
Base angles are congruent

Trapezoid



If *isosceles*, then
DIAGONALS ARE CONGRUENT

KITE

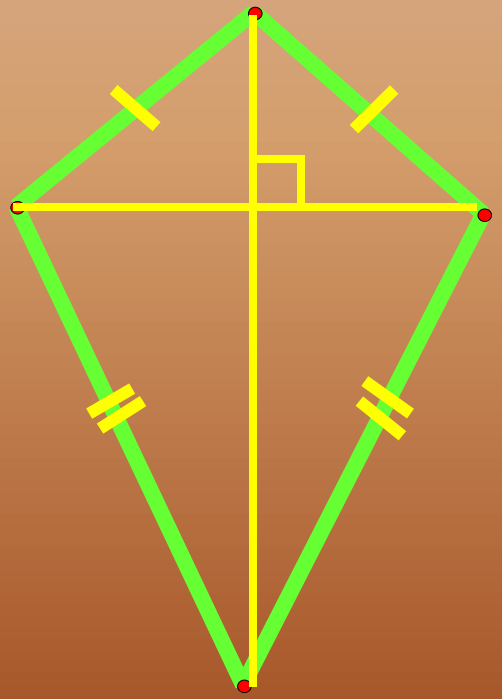


TWO PAIRS OF CONSECUTIVE CONGRUENT SIDES (opposite sides not congruent)

A quadrilateral is a KITE if and only if it has:

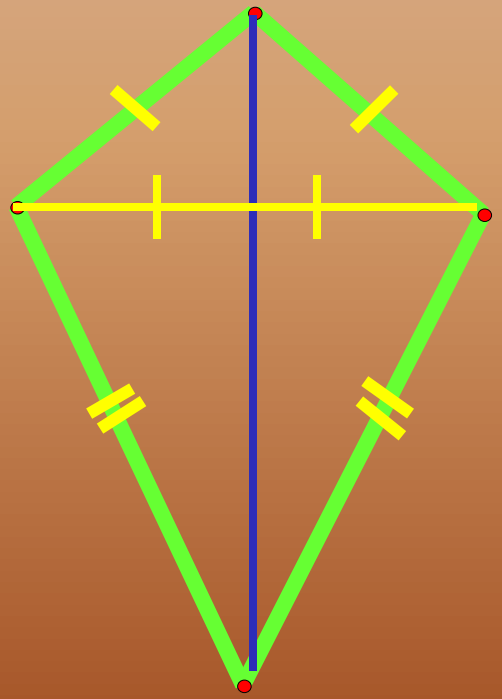
two pairs of congruent consecutive sides

KITE



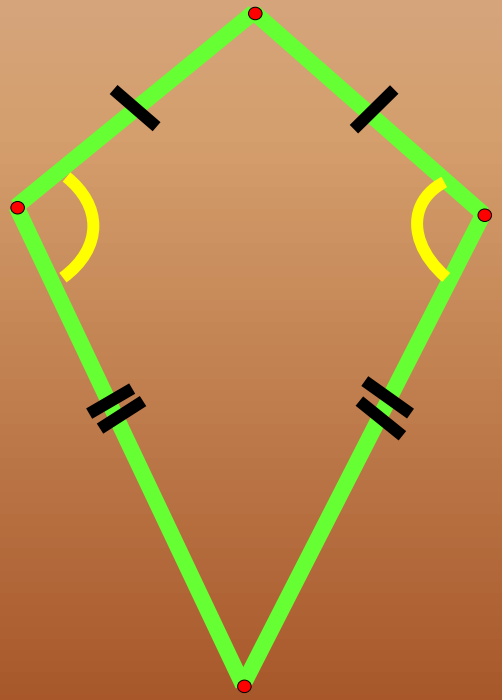
Diagonals are perpendicular

KITE



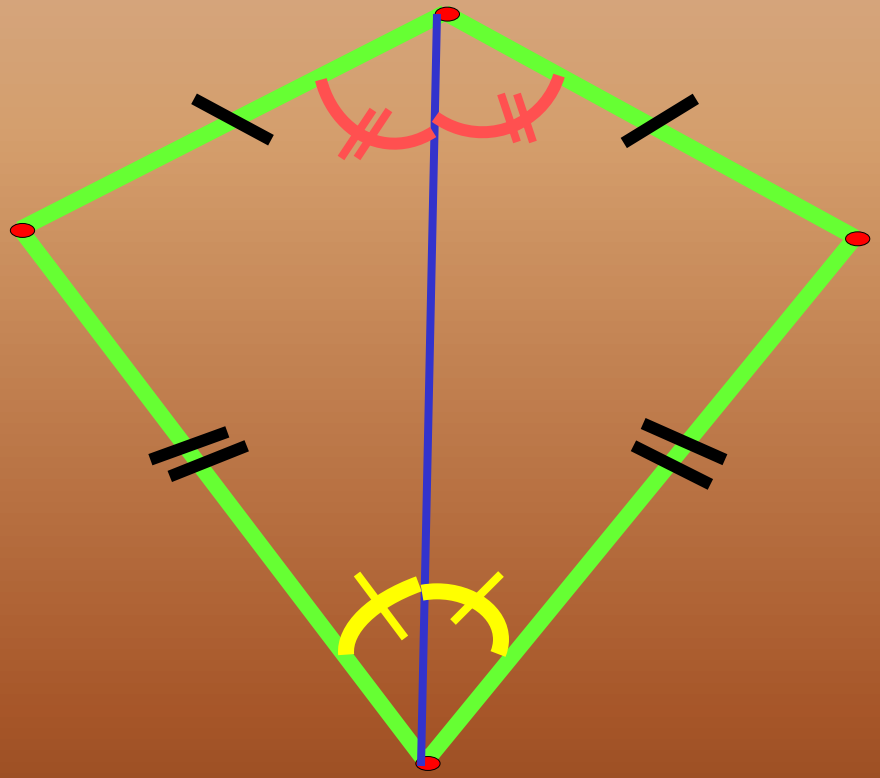
Short diagonal is bisected

KITE



ONE pair of opposite angles is congruent (not both)

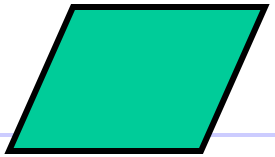
KITE



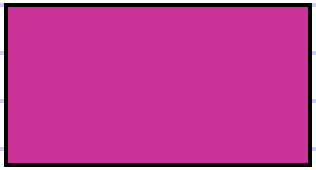
The other angles are bisected by the diagonal

Foldable

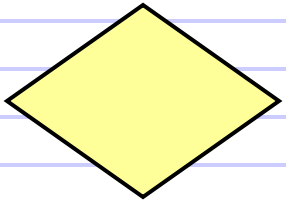
QUADRILATERALS



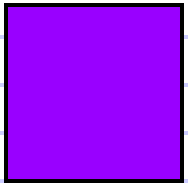
1. Opposite sides parallel.
2. Opposite sides congruent.
3. Opposite angles are congruent.
4. Consecutive angles are supplementary
5. Diagonals bisect each other.



1. Has 4 right angles.
2. Diagonals are congruent.
3. All properties of parallelogram.

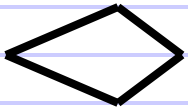


1. Has 4 Congruent **sides**
2. Diagonals bisect opposite angles.
3. Diagonals are perpendicular.
4. All properties of parallelograms.



1. 4 congruent sides and 4 congruent (right) angles
2. All properties of parallelogram, rectangle, and rhombus

1. One pair of parallel sides
2. Leg angles supplementary
3. Midsegment= $\frac{1}{2}(b_1 + b_2)$
4. Isosceles—see back

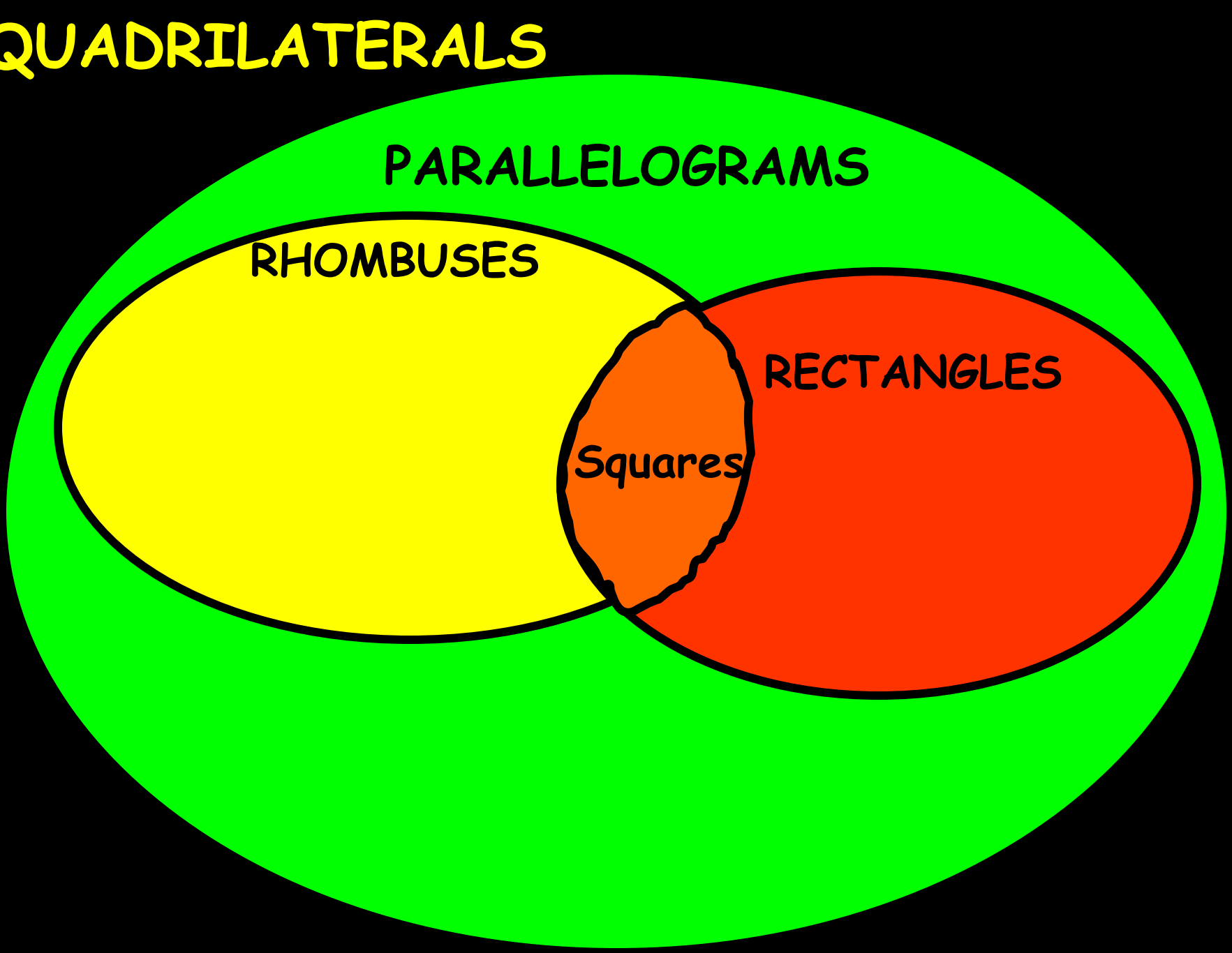


1. 2 pairs of consecutive sides congruent
2. 1 pair of opposite angles congruent
3. Diagonals perpendicular
4. Small diagonal bisected
5. Non-congruent angles are bisected

Isosceles Trapezoid:

1. 2 pairs of congruent base angles
2. Diagonals are congruent

Let's make a Venn Diagram relating all of the properties of our quadrilaterals


QUADRILATERALS
PARALLELOGRAMS
RHOMBUSES
RECTANGLES
Squares

QUADRILATERALS

1. Polygon
2. 4 sides

PARALLELOGRAMS

RHOMBUSES

1. Diagonals bisect angles
2. Perpendicular Diagonals
3. Congruent sides

Squares

RECTANGLES

1. Four right angles
2. Congruent diagonals

1. Opposite sides congruent
2. Opposite angles congruent
3. Opposite sides parallel
4. Consecutive angles supplementary
5. Diagonals bisect each other

QUADRILATERALS

1. Polygon
2. 4 sides

PARALLELOGRAMS

1. Opposite sides congruent
2. Opposite angles congruent
3. Opposite sides parallel
4. Consecutive angles supplementary
5. Diagonals bisect each other

RHOMBUSES

1. Diagonals bisect angles
2. Perpendicular Diagonals
3. Congruent sides

Squares

RECTANGLES

1. Four right angles
2. Congruent diagonals

Kites

Trapezoids

Isosceles Trapezoids