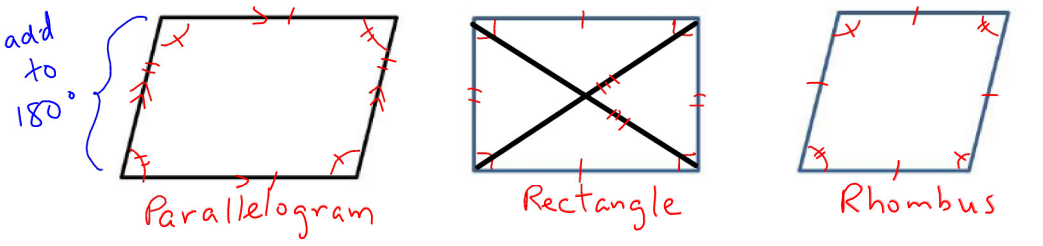
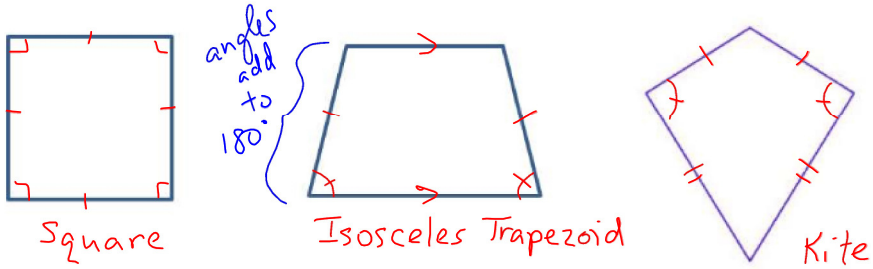
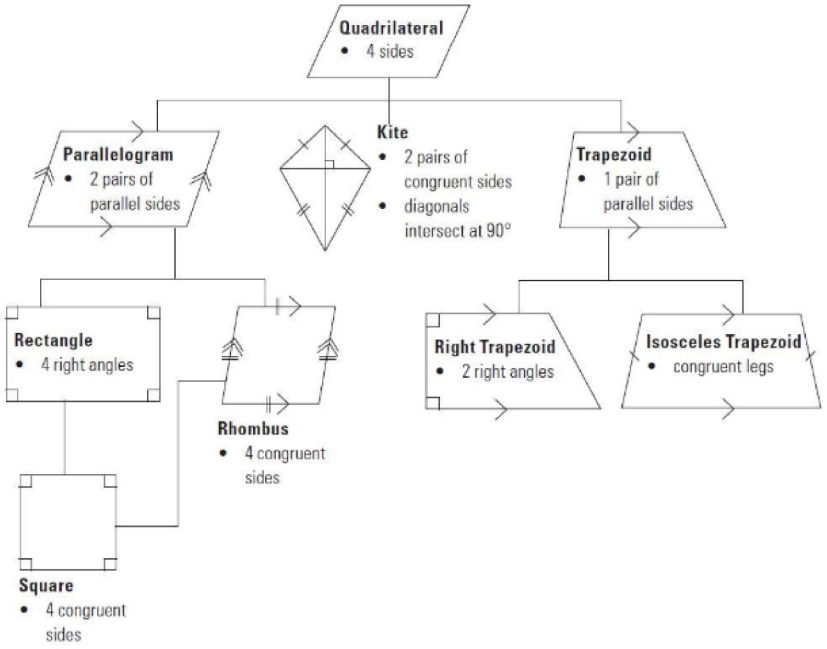
Lesson 3 Properties of Quadrilaterals

Six special Quadrilaterals:

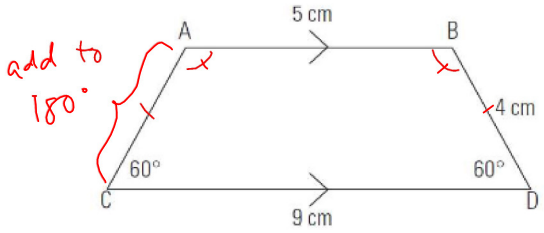






Example 1

Given quadrilateral ABCD, determine the lengths of AC, angle A and angle B.



add to 180°

isosceles trapezoid

AC = 4cm

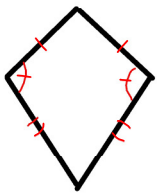
A and C are supplementary angles (add up to 180°)

∴ A = 180° − 60° = 120°

B = 120°

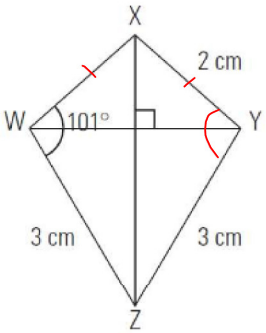
Example 2

A kite is a type of quadrilateral. Sketch a kite and identify all congruent interior angles and sides.



Example 3

Given kite WXYZ, determine the lengths of WX and angle XYZ.



WX = 2cm

XYZ = 101°

follow letters

X → Y → Z

middle

Example 4

List all the quadrilaterals that could fit each description.

a.) A quadrilateral which has at least one set of parallel sides.

parallelogram, rectangle, rhombus, square, isosceles trapezoid

b.) A quadrilateral which has four equal sides.

rhombus, square

c.) A quadrilateral which has two equal sides.

parallelogram, rectangle (2 pairs of equal sides), isosceles trapezoid, kite (2 pair)

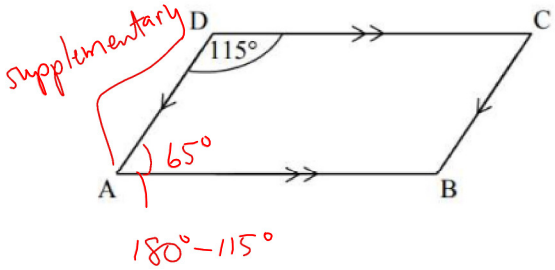
Example 5

State two properties of an isosceles trapezoid.

1) Legs are congruent.
2) Base angles are congruent

Example 6

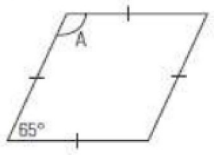
State the measure of angle A.



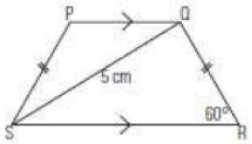
Assignment

1.) Determine the measure of the indicated length or angle.

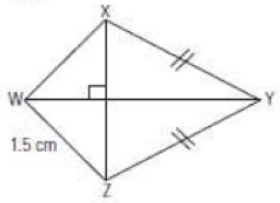
a) ∠A



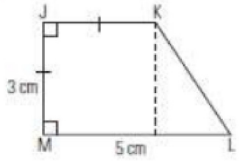
b) PR



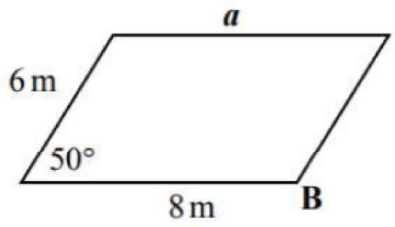
c) WX



d) ∠L



2.) State the length of side *a* and the measure of angle B in the given parallelogram.



3.) Sketch and name a quadrilateral that fits each description. Make sure to label all equal sides and angles.

a.) The diagonals are equal, but the sides are not all equal.

b.) The diagonals are equal and all the sides are equal.

c.) The diagonals are not equal and no two sides are equal.

4.) Justify why the following statement is false.

"If a quadrilateral has one pair of parallel sides and one pair of congruent sides, then the quadrilateral must be a parallelogram."