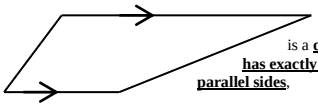
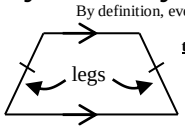
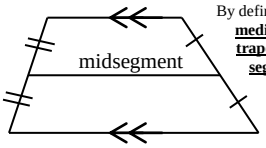
Trapezoids: Properties Discovery Activity



By definition, every **trapezoid** is a **quadrilateral** that **has exactly one pair of parallel sides**.



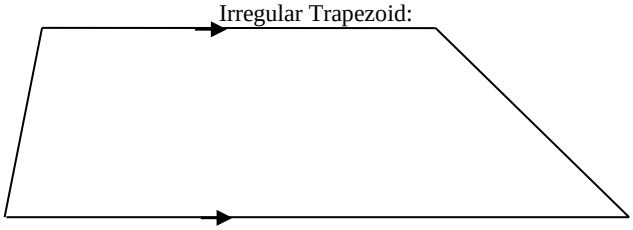
By definition, every **isosceles trapezoid** is a **trapezoid** that **has two congruent (but nonparallel) legs**.



By definition, every **median/midsegment of a trapezoid** is a **line segment** that **has its endpoints at the midpoints of the two (nonparallel) legs of a trapezoid**.

Answer the questions about the figures below:

Irregular Trapezoid:



1) Measure all four interior angles. Are any of the four angles congruent? ___

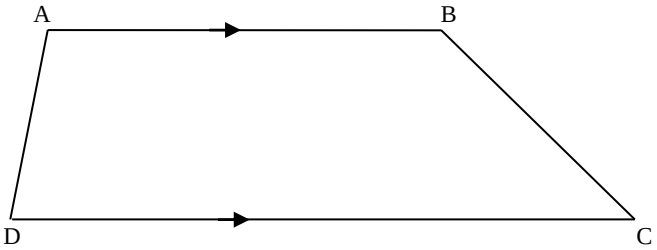
2) Measure the lengths of the two **non-parallel sides**. Are the two non-parallel sides congruent? ___

3) Measure the lengths of the **two parallel sides**. Are the two parallel sides congruent? _____

Draw the two **diagonals**. Measure their lengths, and the angle they form with one another.

4) Are the diagonals congruent? _____

5) Are the diagonals perpendicular? _____



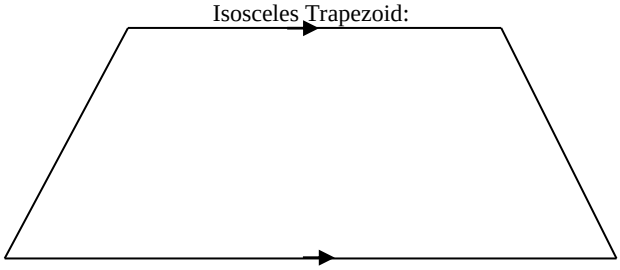
Expand every segment in the trapezoid.

What kind of angles do you notice ∠A and ∠D, and ∠B and ∠C are?

_____

6) What is, therefore, the relationship between the consecutive angles that are on the same side of the trapezoid? _____

Isosceles Trapezoid:



Draw the two diagonals. Measure their lengths, and the angle they form with one another.

7) Are the diagonals congruent? _____

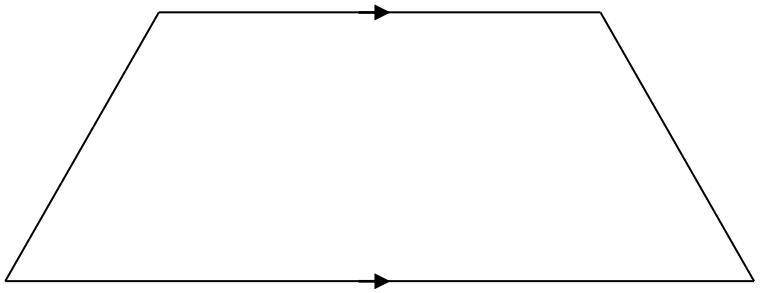
8) Are the diagonals perpendicular? _____

9) Measure the two **legs (the non-parallel sides)**. Are they congruent? _____

10) Measure the lengths of the two **parallel sides**.

Are the two parallel sides congruent? _____

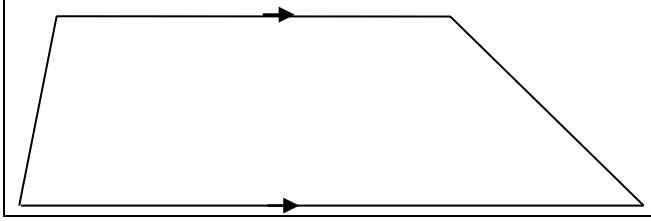
Isosceles Trapezoid:



11) Measure the two **acute base angles**. Compare their measures: The two acute base angles of an isosceles trapezoid are _____ to each other.

12) Measure the two **obtuse base angles**. Compare their measures: The two obtuse base angles of an isosceles trapezoid are _____ to each other.

13) Add the measures of **one acute** and **one obtuse** angle. What do you notice about the **sum**? In an isosceles trapezoid, an obtuse base angle and an acute base angle are always _____.



Measure each of the legs, and find their midpoints. Connect the two midpoints to form the midsegment. Then, form a right triangle connecting the two bases, and measure the distance from each base to the midsegment. What do you notice?:

14) The measure from each base to the midsegment in a trapezoid is _____.

Summarize, in your own words, the properties of trapezoids in general, and those particular to isosceles trapezoids only.

General properties of trapezoids	Properties of isosceles trapezoids