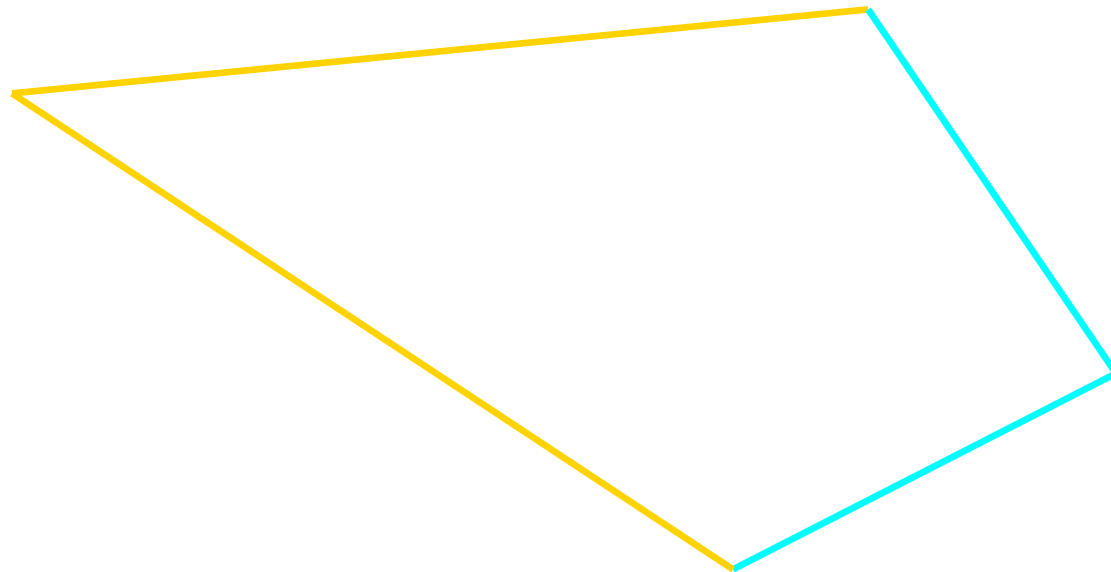


5.3 Kites and Trapezoids

Kite Investigation

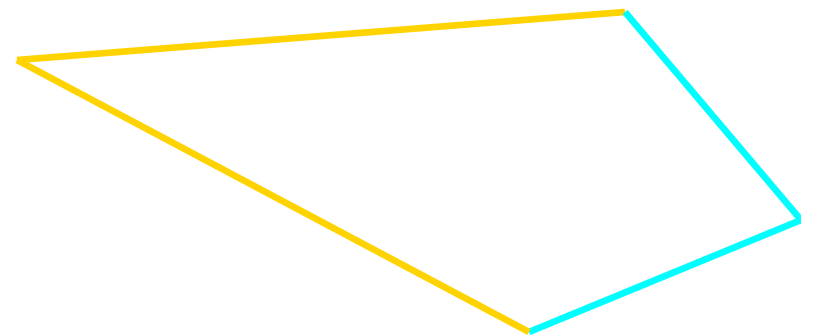
Recall the shape of a toy kite.
What definition would you write
to describe the shape in
geometric terms?



Kite Investigation

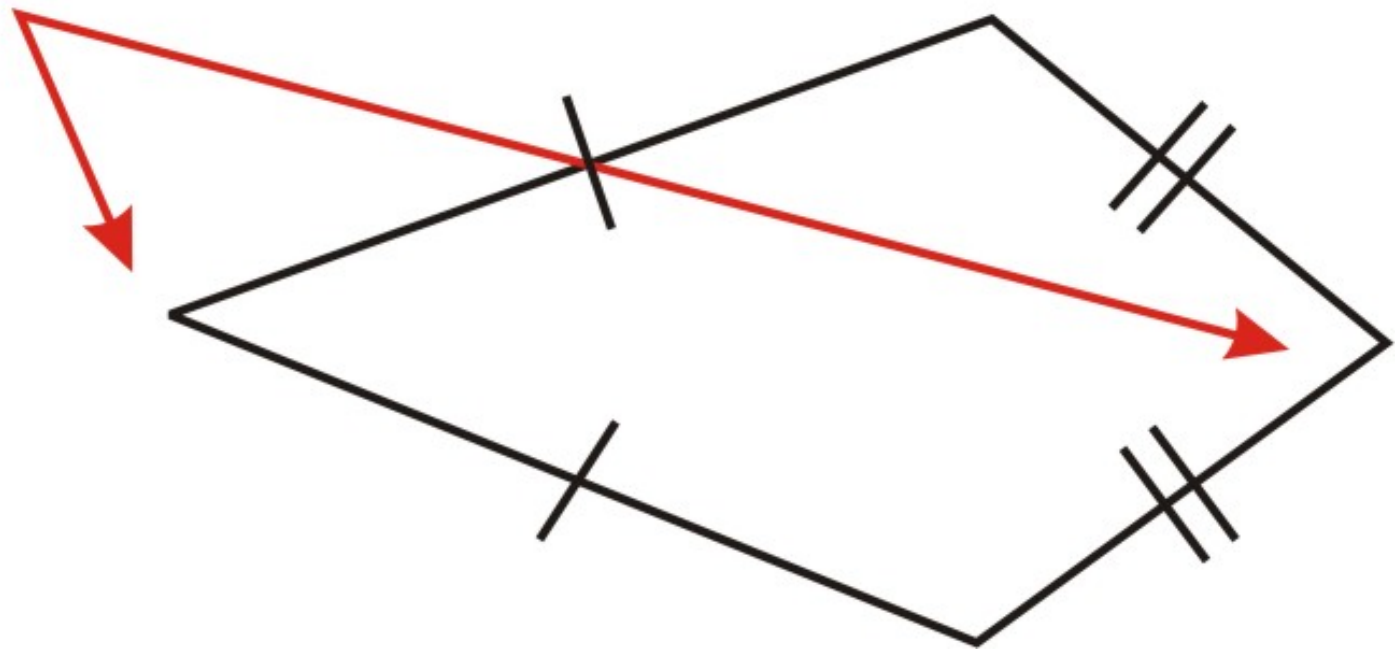
Kite Definition

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



Vertex Angles

Vertex angles



Vertex Angles are angles between congruent sides

Kite Investigation

- **Get your supplies**
 - **Straight Edge**
 - **Patty Paper**

Kite Investigation

- On a piece of patty paper, draw two line segments of different length



Kite Investigation

- **Fold the paper, so that the endpoints are exactly on the fold**



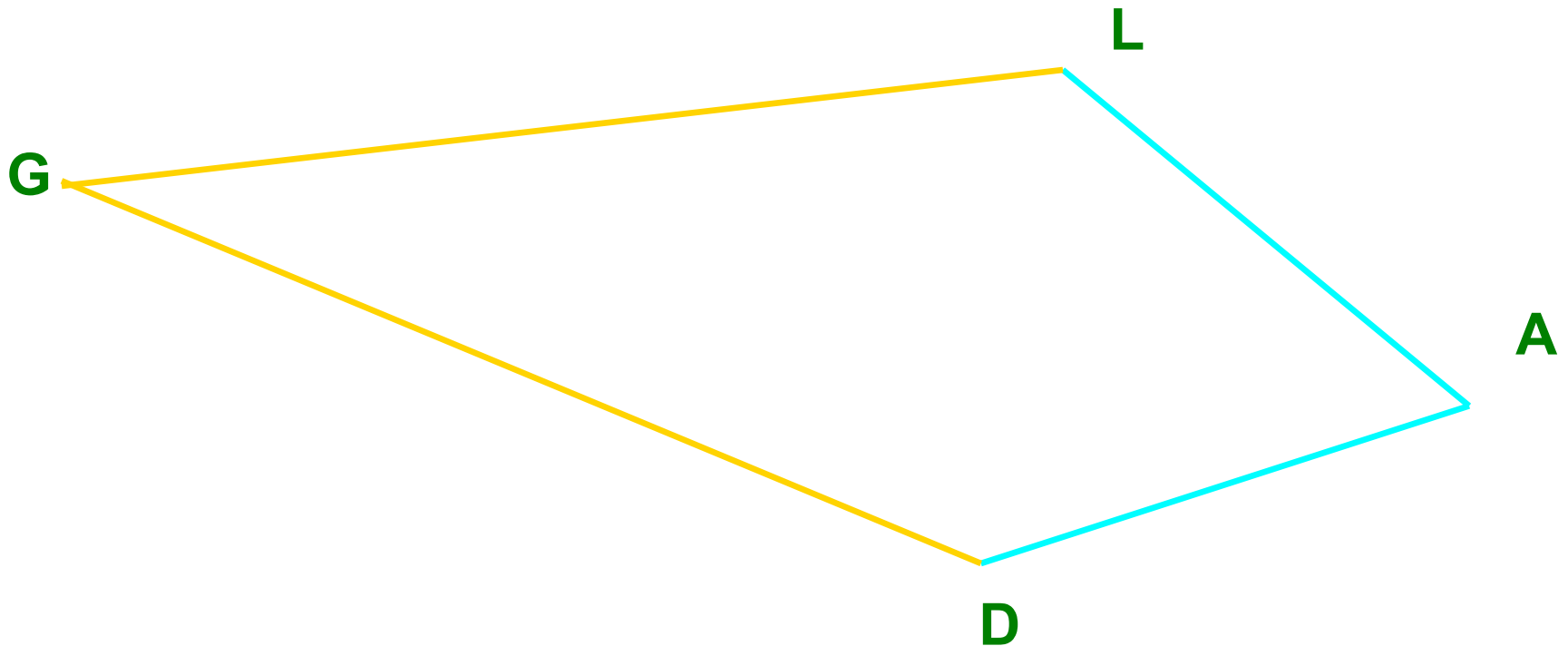
Kite Investigation

- Trace the first two segments through the patty paper



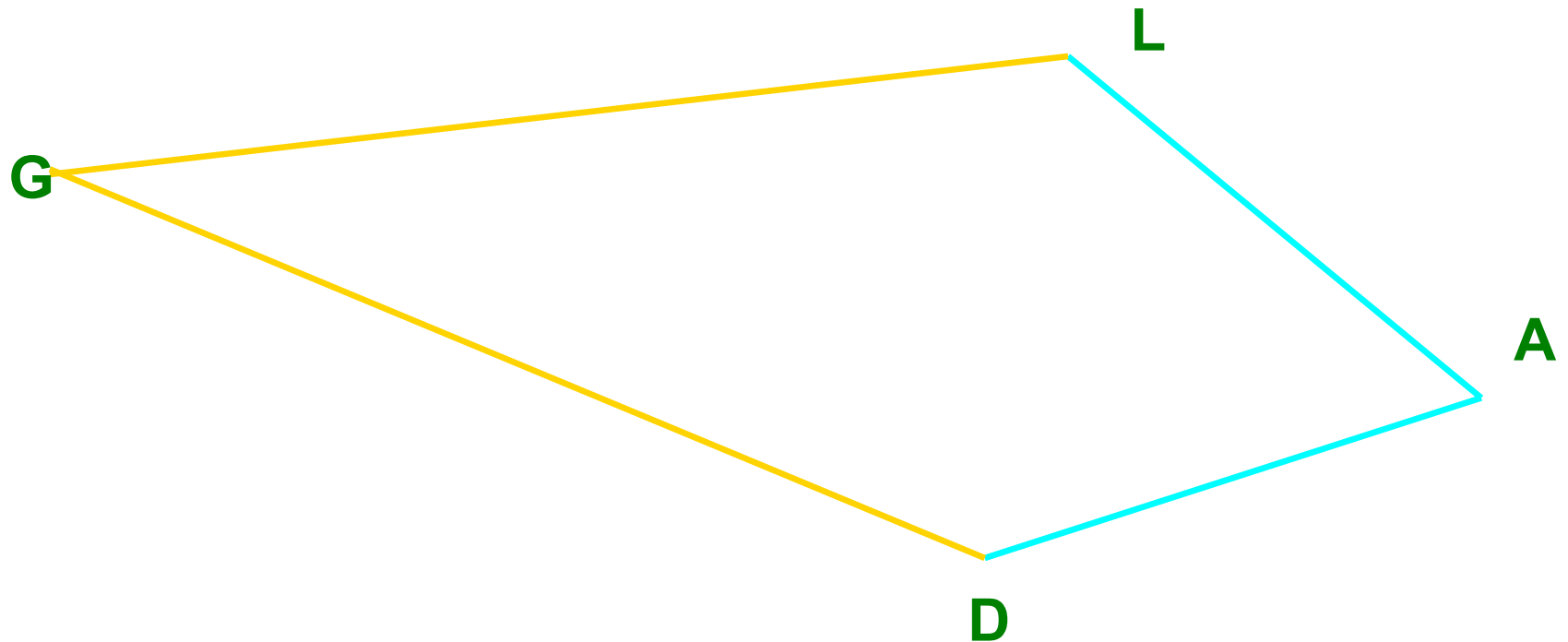
Kite Investigation

- Unfold the paper and label your kite
G,L,A,D



Kite Investigation

- Measure each of the four angles
- What conclusions can you draw?

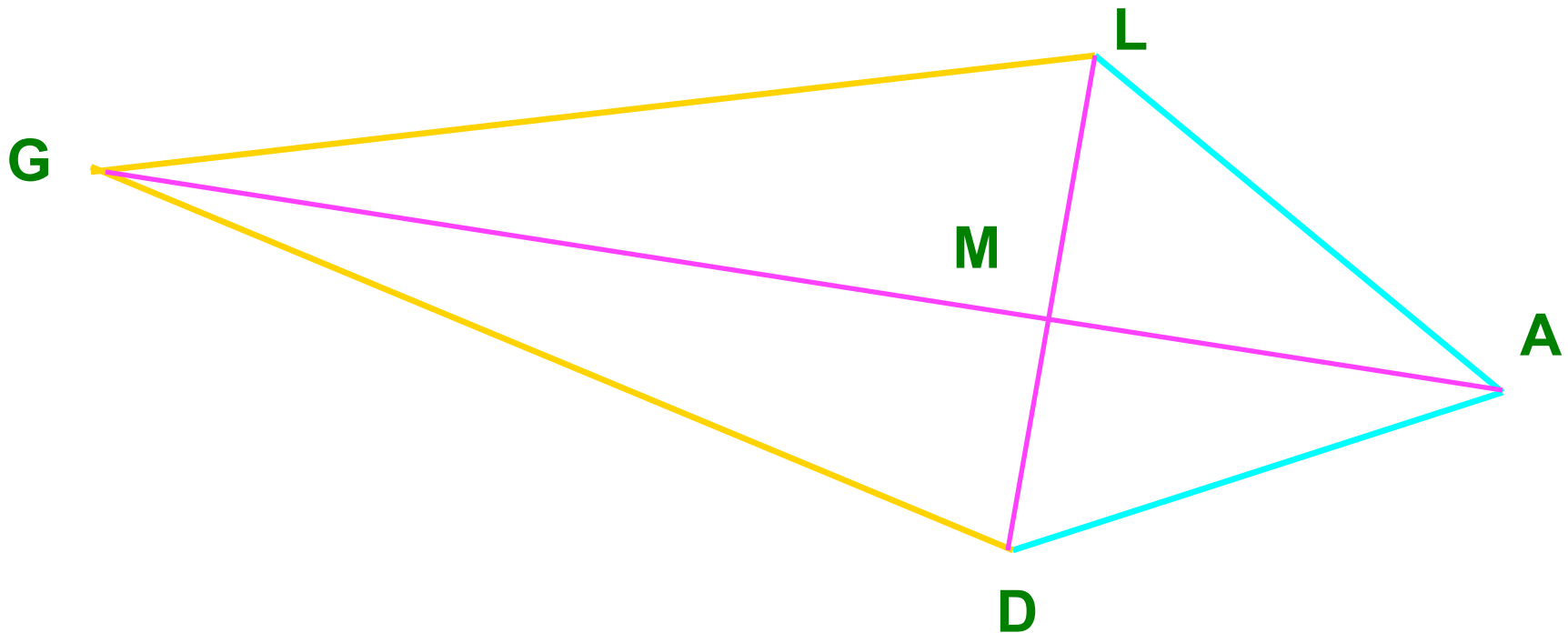


Kite Angles Conjecture

- The **opposite** angles of a kite are **congruent**.

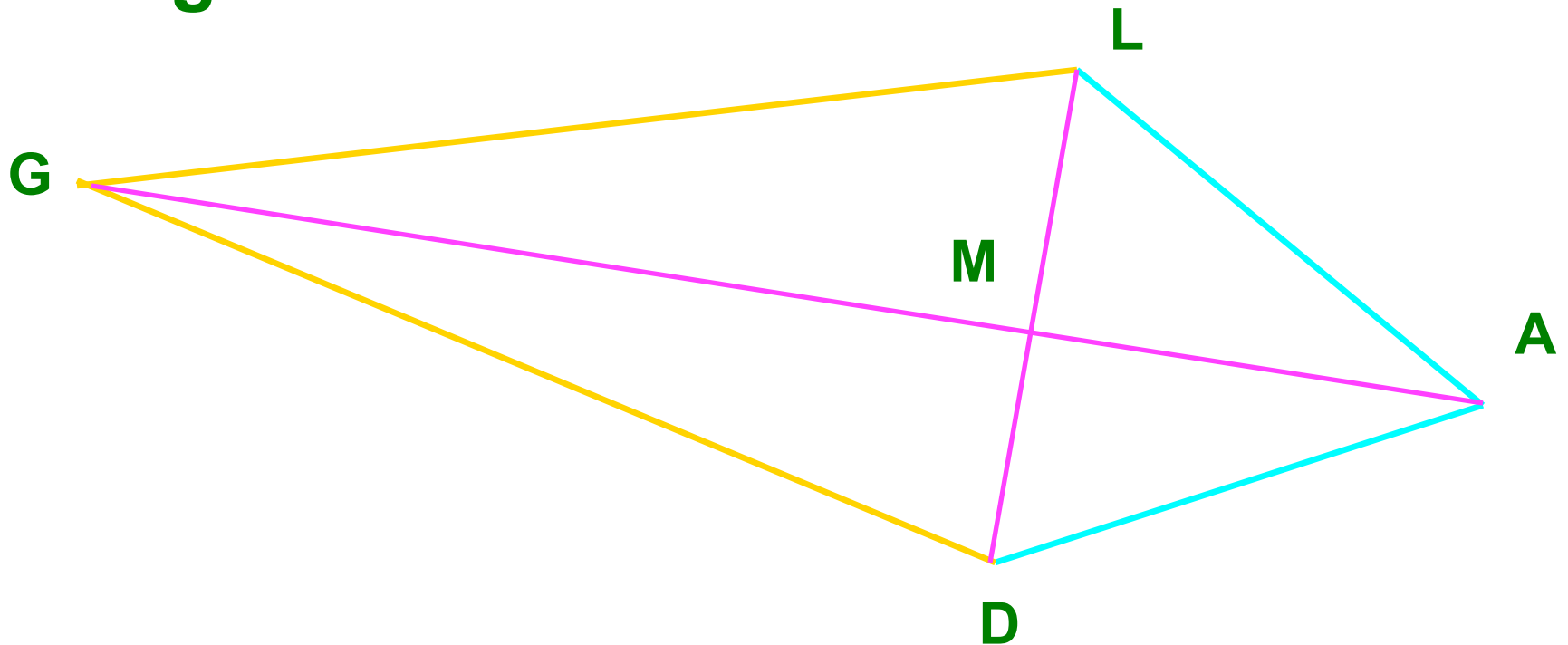
Kite Investigation

- Add the diagonals into your diagram
- Label the intersecting point M



Kite Investigation

- Measure the angles at point M
- What can you conclude about the diagonals?

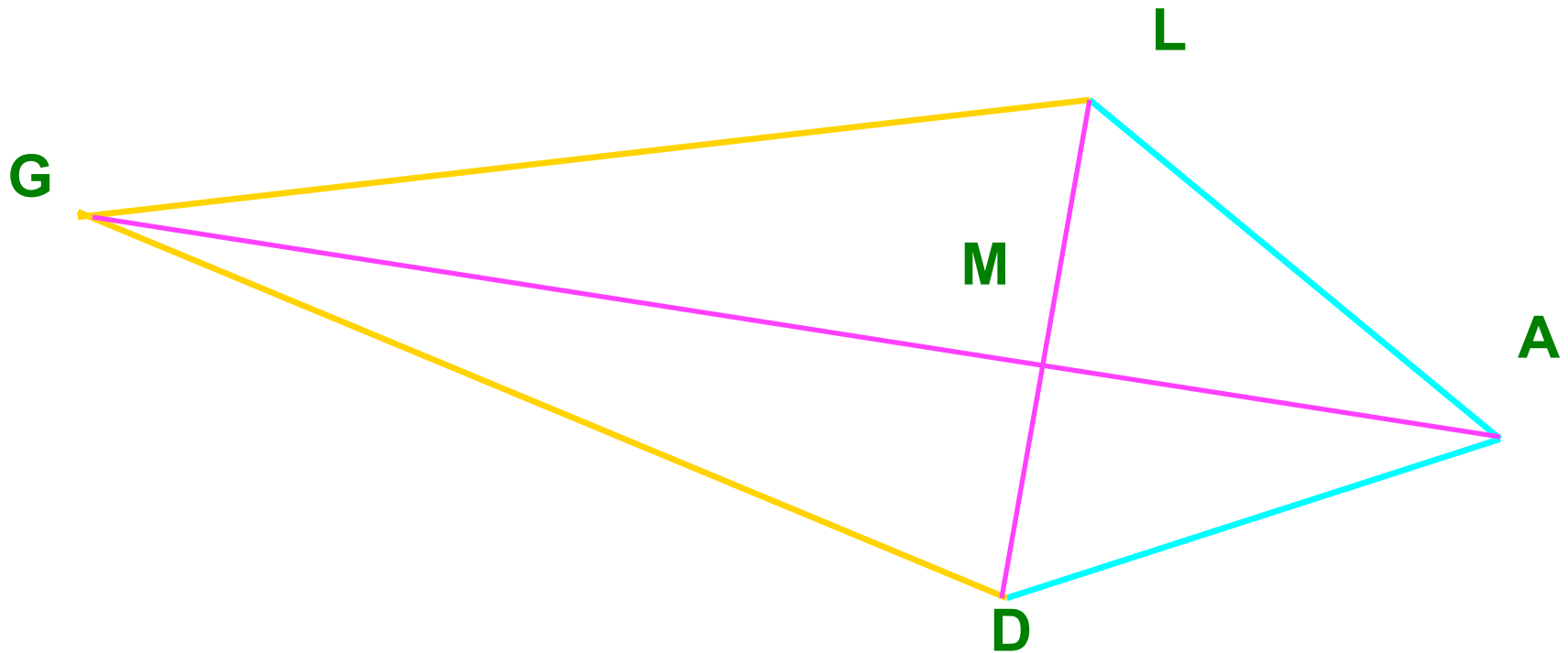


Kite Diagonals Conjecture

- **The diagonals of a kite are**

Kite Investigation

- Measure LM and MD
- What can you conclude?

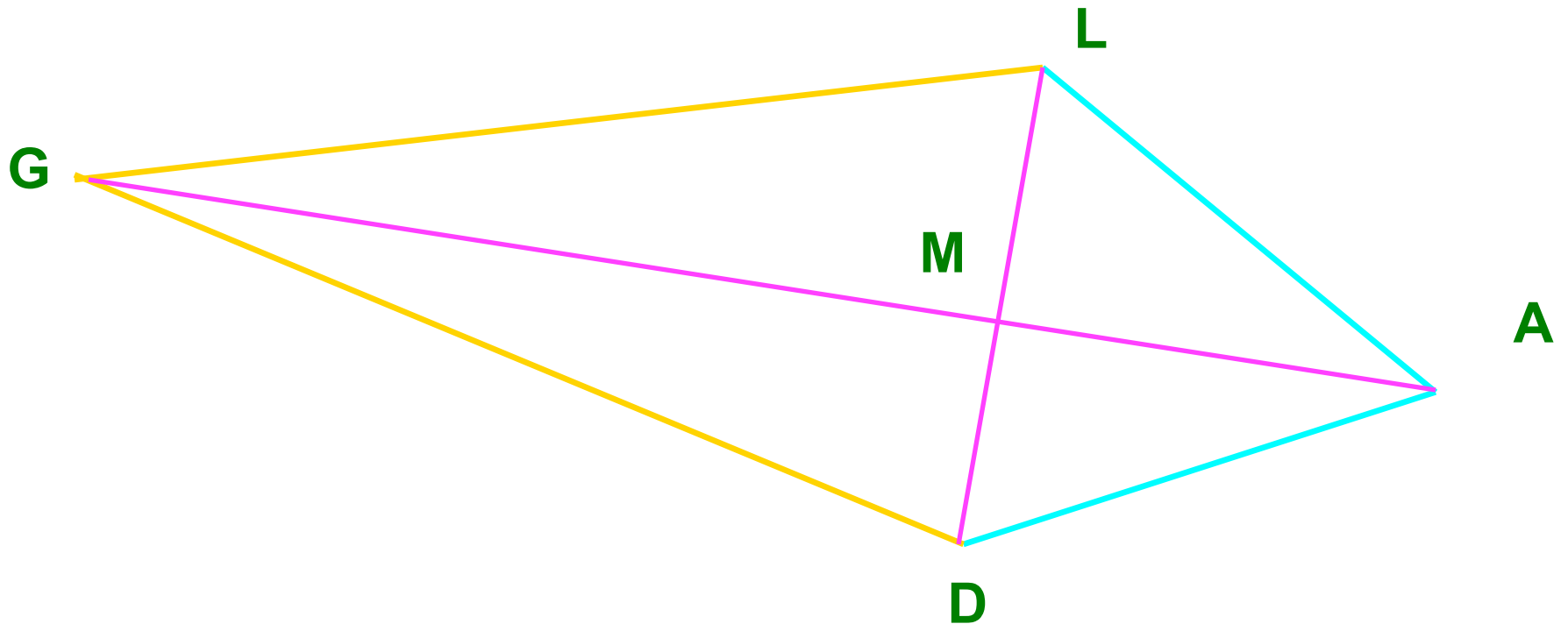


Kite Diagonal Bisector Conjecture

- The diagonal connecting the vertex angles of a kite is the bisector of the other diagonal

Kite Investigation

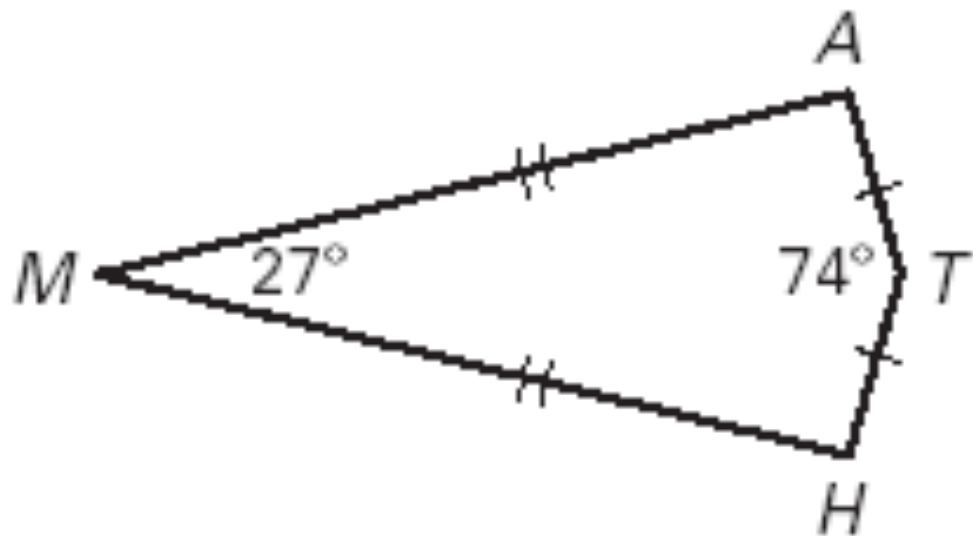
- Fold along the diagonals
- Does either diagonal bisect any angles?



Kite Angle Bisector Conjecture

- The **angles of a kite**
are **by a**

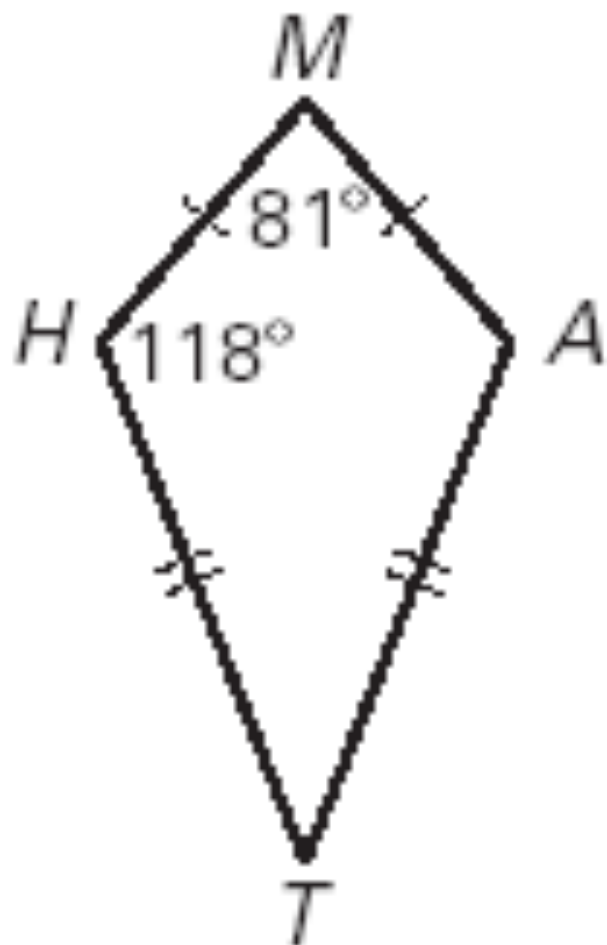
Find the measure of the angles in kite *MATH*.



$$a = 129.5^\circ$$

$$h = 129.5^\circ$$

Find the measure of the angles in kite *MATH*.



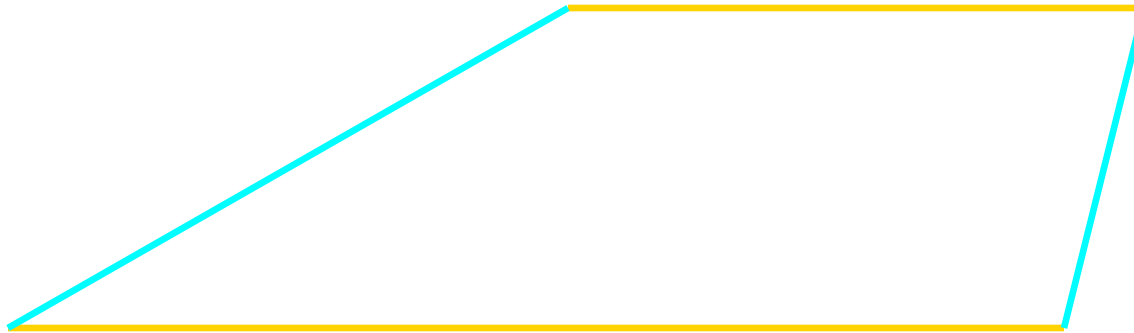
$$a = 118^\circ$$

$$t = 43^\circ$$

Trapezoid Definition

Trapezoid Definition

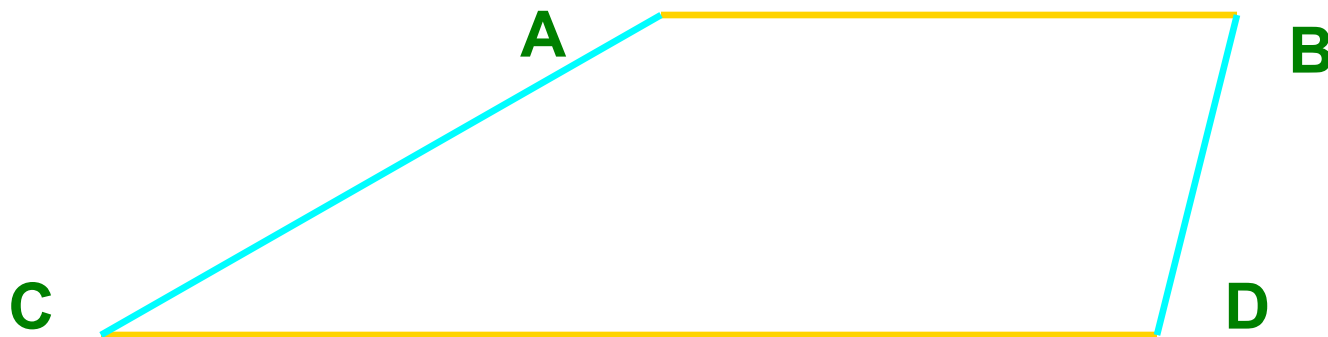
- **A trapezoid is a quadrilateral with exactly one pair of parallel sides**



Trapezoid Vocabulary

Trapezoid Definitions

- The parallel sides are called **bases**
- A pair of angles that share a base are called **base angles A&B, C&D**



Trapezoid Consecutive Angles Conjecture

- **The consecutive angles between the bases of a trapezoid are**

Trapezoid Investigation

Isosceles Trapezoid

- An isosceles trapezoid has congruent legs



Trapezoid Investigation

- **Get your supplies**
 - **Protractor**
 - **Straight Edge**
 - **Paper**

Trapezoid Investigation

- **Draw two parallel lines** – at least two inches apart
- **Use a compass to create two equal length legs**
- **Label the vertices H,O,W,E**



Trapezoid Investigation

- **Measure each pair of base angles**

angle H = ?

angle O = ?

angle W = ?

angle E = ?



Trapezoid Investigation

- What can you conclude about the base angles in an isosceles trapezoid?

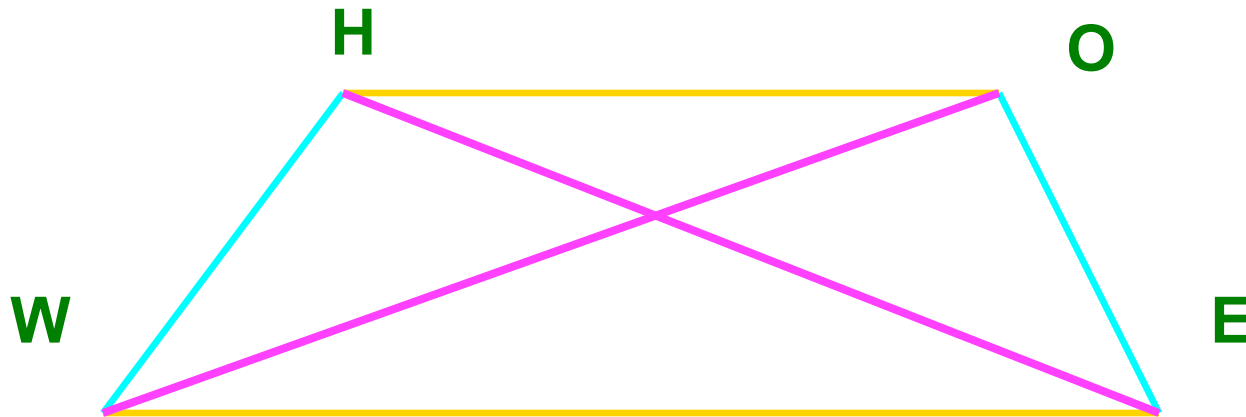


Isosceles Trapezoid Conjecture

The base angles of an isosceles trapezoid are

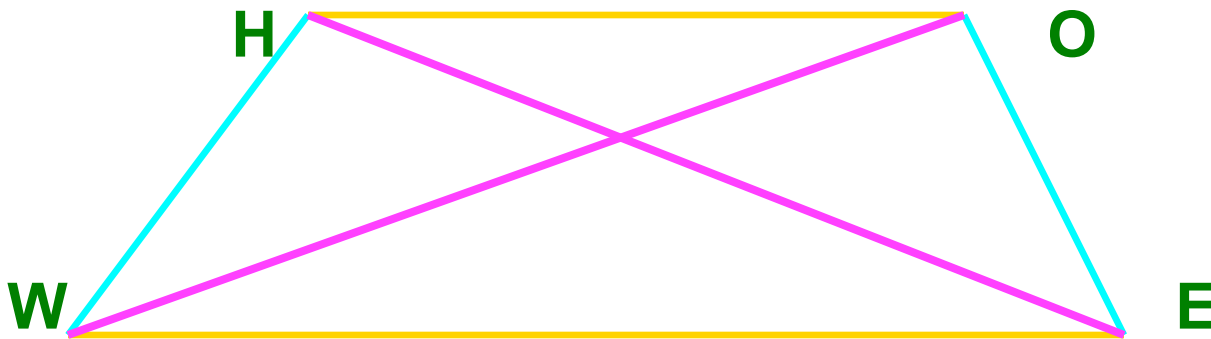
Trapezoid Investigation

- Add the diagonals of the isosceles trapezoid



Trapezoid Investigation

- Compare the lengths of the two diagonals
- What conclusion can we make?

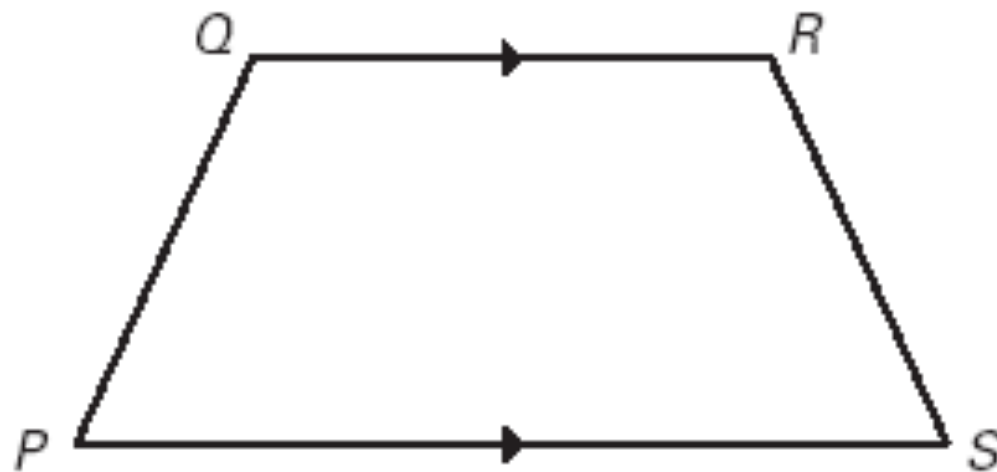


Isosceles Trapezoid Diagonals Conjecture

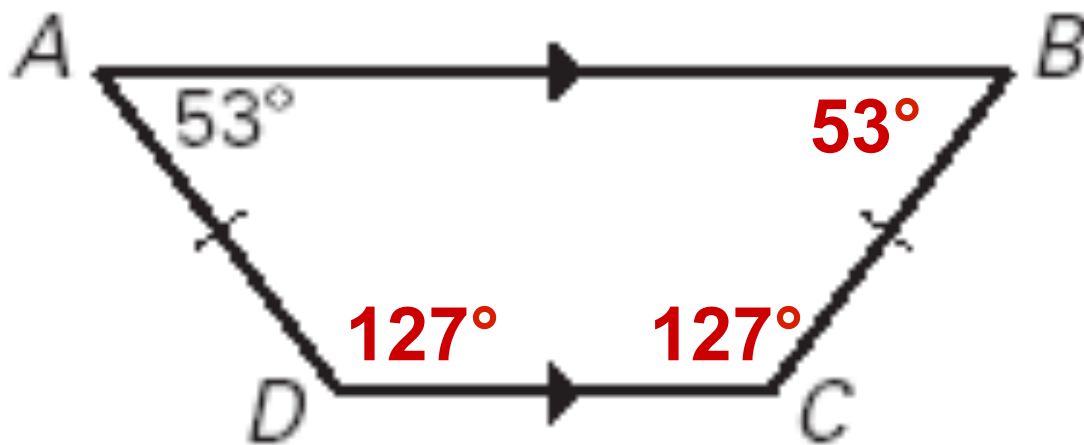
- **The diagonals of an isosceles trapezoid are**

Match the pair of segments or angles with the term that describes them in trapezoid $PQRS$.

1. \overline{QR} and \overline{PS} ————— **A.** bases
2. \overline{PQ} and \overline{RS} ————— **B.** legs
3. \overline{QS} and \overline{PR} ————— **C.** diagonals
4. $\angle Q$ and $\angle S$ ~~—————~~ **D.** base angles
5. $\angle S$ and $\angle P$ ~~—————~~ **E.** opposite angles



Find the angle measures of $ABCD$.



$CDEF$ is an isosceles trapezoid with $CE = 10$ and $m\angle E = 95^\circ$.
Find DF , $m\angle C$, $m\angle D$, and $m\angle F$.

- $DF = 10$
- Angle $C = 85^\circ$
- Angle $D = 95^\circ$
- Angle $F = 85^\circ$

Find the angle measures of $ABCD$.

