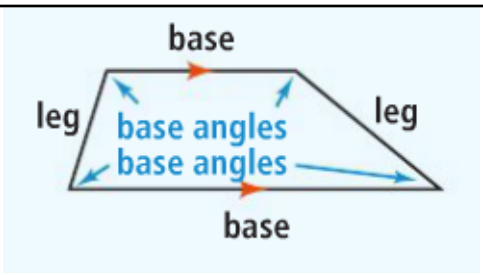
6-6 Trapezoids and Kites

Objective To verify and use properties of trapezoids and kites



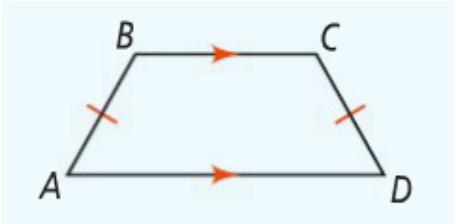
Trapezoid - a quadrilateral with one pair of parallel sides.

Bases - the parallel sides of a trapezoid.

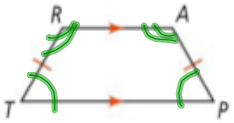
Legs - the nonparallel sides of a trapezoid.

Base Angles - the two angles that share a base of the trapezoid. (2 pairs)

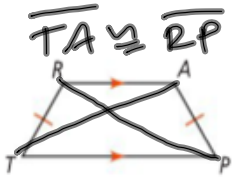
Isosceles Trapezoid - a trapezoid with congruent legs.



If a quadrilateral is an isosceles trapezoid, then base angles are ≅.

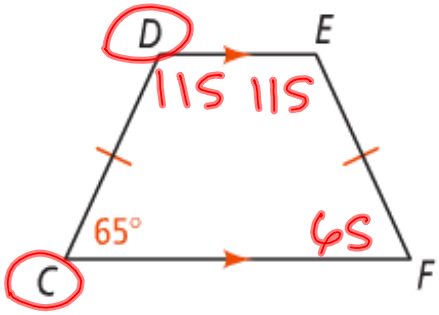


If a quadrilateral is an isosceles trapezoid, then its diagonals are congruent.



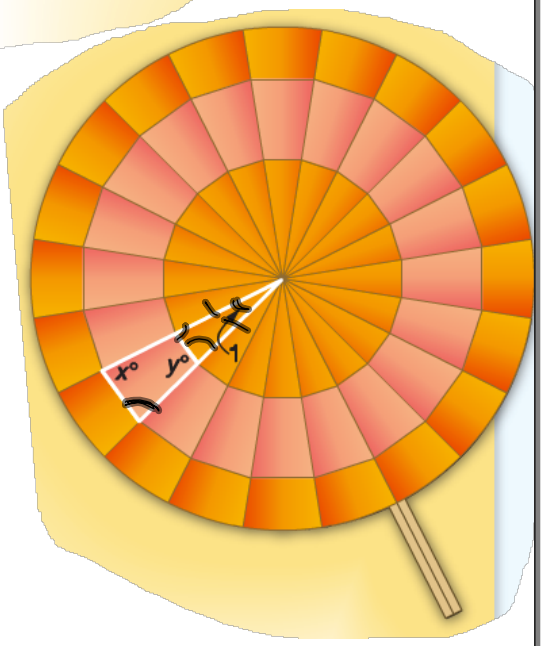
Problem 1 Finding Angle Measures in Trapezoids

CDEF is an isosceles trapezoid and $m\angle C = 65$. What are $m\angle D$, $m\angle E$, and $m\angle F$?



Problem 2 Finding Angle Measures in Isosceles Trapezoids

Paper Fans The second ring of the paper fan shown at the right consists of 20 congruent isosceles trapezoids that appear to form circles. What are the measures of the base angles of these trapezoids?



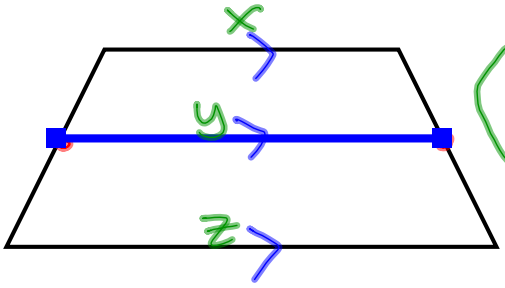
$\frac{360}{20} = 18$

$\frac{180 - 18}{2} = 81$

$180 - 81 = 99 = y$

$x = 81$

We know what a MIDSEGMENT of a triangle is from 1st semester.
What do you think a MIDSEGMENT of a trapezoid is?



$\frac{x+z}{2} = y$

mdpts. of LEGS

The midsegment of a trapezoid is....

- // to the bases.

- the length is equal to the average of the two bases.

Problem 3 Using the Midsegment of a Trapezoid

Algebra $\overline{QR}$ is the midsegment of trapezoid $LMNP$. What is x?

$$\frac{4x - 10 + 8}{2} = (x + 2) \cdot 2$$

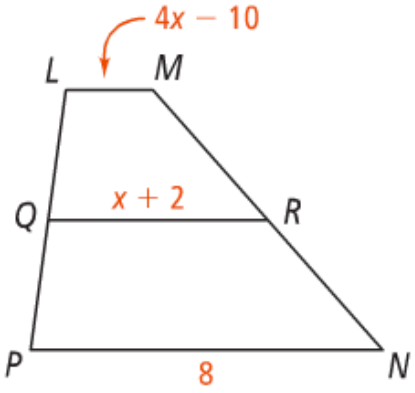
$$4x - 2 = 2x + 4$$

$$-2x \qquad -2x$$

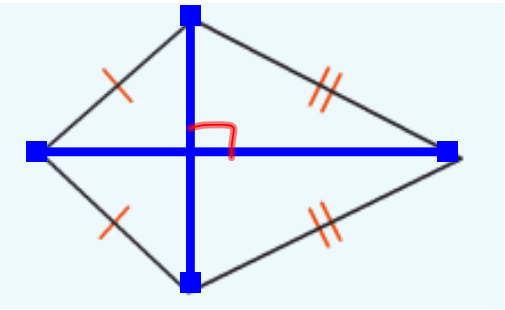
$$2x - 2 = 4$$

$$2x = 6$$

$$x = 3$$



Kite - a quadrilateral with two pairs of adjacent sides congruent and no opposite sides congruent.



If a quadrilateral is a kite, then its diagonals are perpendicular

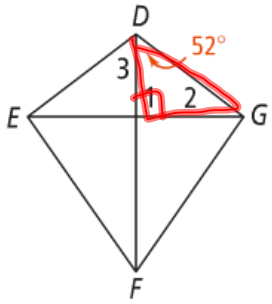
Problem 4 Finding Angle Measures in Kites

Quadrilateral *DEFG* is a kite. What are $m\angle 1$, $m\angle 2$, and $m\angle 3$?

$m\angle 1 = 90°$

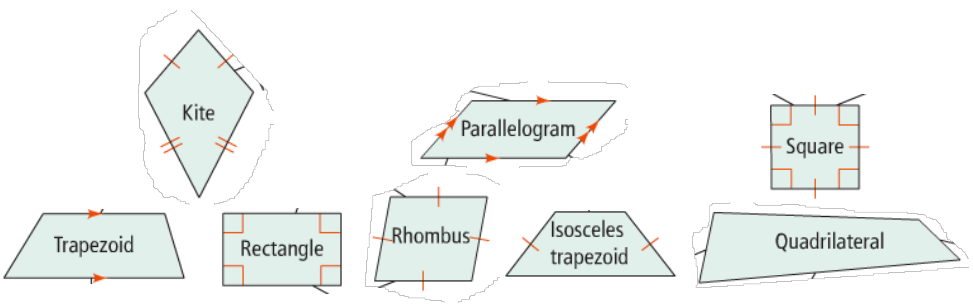
$m\angle 2 = 38°$

$m\angle 3 = 52°$



Quadrilateral Tree

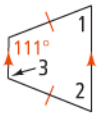
How do all of these quadrilaterals fit together?



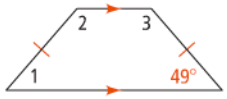
Find the measures of the numbered angles in each isosceles trapezoid. See Problems 1 and 2.

7.

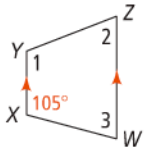
8.



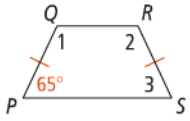
9.



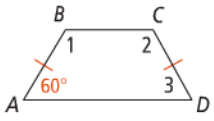
10.



11.

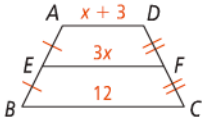


12.

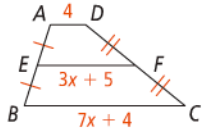


Find *EF* in each trapezoid. See Problem 3.

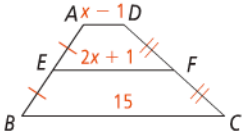
13.



14.

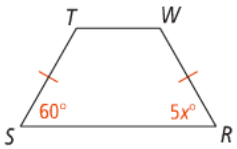


15.

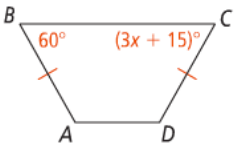


Algebra **Find the value of the variable in each isosceles trapezoid.**

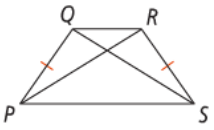
28.



29.



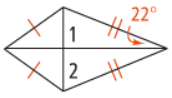
30.



$QS = x + 5$
$RP = 3x + 3$

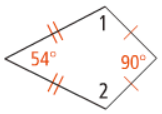
Find the measures of the numbered angles in each kite. See Problem 4.

16.

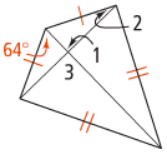


17.

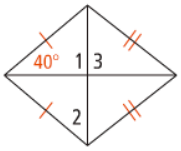
18.



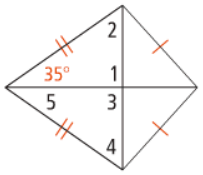
19.



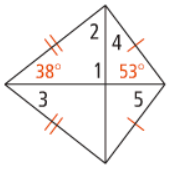
20.



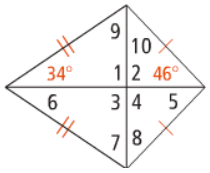
21.



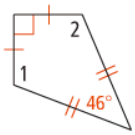
22.



23.

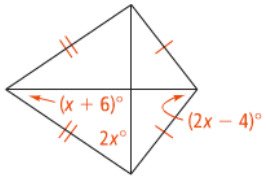


24.

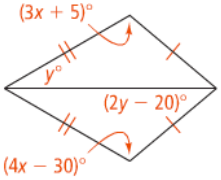


Algebra **Find the value(s) of the variable(s) in each kite.**

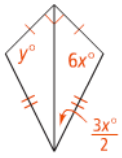
34.



35.



36.



Trapezoid (1) defn

Isos Trap (3) defn

Kite (2) defn