
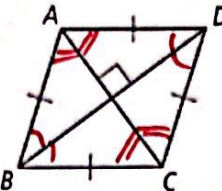
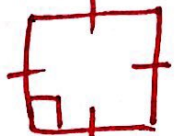
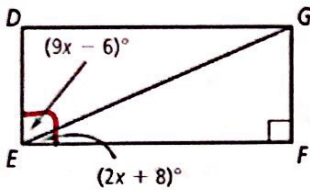


Quadrilaterals

SWBAT use the properties of quadrilaterals to solve for unknowns.

Rectangle	Rhombus	Square
A rectangle is a parallelogram with four right angles.	A rhombus is a parallelogram with four congruent sides.	A square is a parallelogram with four congruent sides and four right angles.
<p>A rectangle has all the properties of a parallelogram PLUS:</p> <ul style="list-style-type: none"> 4 right angles Diagonals are congruent 	<p>A rhombus has all the properties of a parallelogram PLUS:</p> <ul style="list-style-type: none"> 4 congruent sides Diagonals bisect angles Diagonals are perpendicular 	<p>A square has all the properties of a parallelogram PLUS:</p> <ul style="list-style-type: none"> All the properties of a rectangle All the properties of a rhombus 

Example 1: Solve for x and the measure of each angle if $\square DGFE$ is a rectangle.



$$9x - 6 + 2x + 8 = 90$$

$$11x + 2 = 90$$

$$11x = 88$$

$$x = 8$$

$$9(8) - 6 = 66^\circ$$

$$2(8) + 8 = 24^\circ$$

Example 2: $\square ABCD$ is a rectangle whose diagonals intersect at point E .

a) If $AE = 36$ and $CE = 2x - 4$, find x .

$$36 = 2x - 4$$

$$40 = 2x$$

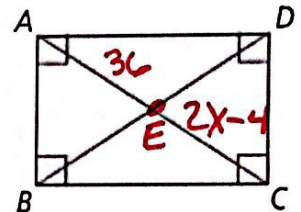
$$x = 20$$

b) If $BE = 6y + 2$ and $CE = 4y + 6$, find y .

$$6y + 2 = 4y + 6$$

$$2y = 4$$

$$y = 2$$



Example 3: Using the diagram to the right to answer the following if $\square ABCD$ is a rhombus.

a) Find the $m\angle 1$.

$$90^\circ$$

b) Find the $m\angle 2$.

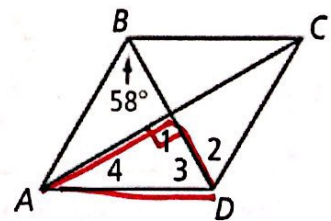
$$58^\circ$$

c) Find the $m\angle 3$.

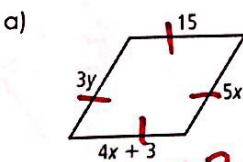
$$58^\circ$$

d) Find the $m\angle 4$.

$$180 - 90 - 58 = 32^\circ$$



Example 4: Solve for each variable if the following are rhombi.



$$15 = 4x + 3$$

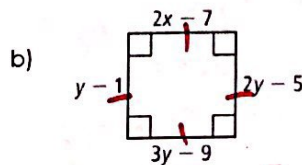
$$12 = 4x$$

$$x = 3$$

$$3y = 5(3)$$

$$3y = 15$$

$$y = 5$$



$$y - 1 = 2y - 5$$

$$4 = y$$

$$2x - 7 = 3(4) - 9$$

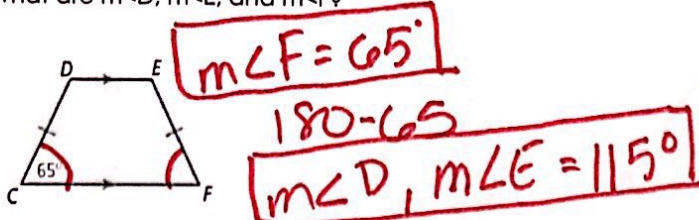
$$2x - 7 = 3$$

$$2x = 10$$

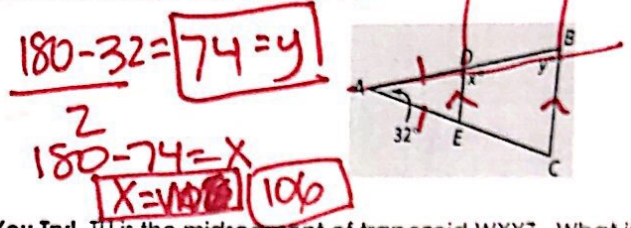
$$x = 5$$

Trapezoid		Isosceles Trapezoids	Trapezoid Midsegment
	<p>A trapezoid is a quadrilateral with exactly one pair of parallel sides, called bases, and two nonparallel sides, called legs.</p>	<p>An isosceles trapezoid is a trapezoid with congruent legs.</p>	<p>The median (also called the midsegment) of a trapezoid is a segment that connects the midpoint of one leg to the midpoint of the other leg.</p>
		<p>A trapezoid is isosceles if there is only:</p> <ul style="list-style-type: none"> • One set of parallel sides • Base angles are congruent • Legs are congruent • Diagonals are congruent • Opposite angles are supplementary <p>$\angle T \cong \angle P, \angle R \cong \angle A$</p>	<p>Theorem: If a quadrilateral is a trapezoid, then a) the midsegment is parallel to the bases and b) the length of the midsegment is half the sum of the lengths of the bases</p> <p>1) $MN \parallel TP, MN \parallel RA$, and 2) $MN = \frac{1}{2}(TP + RA)$</p> <p><i>mid = 1/2 (top + bottom)</i></p>

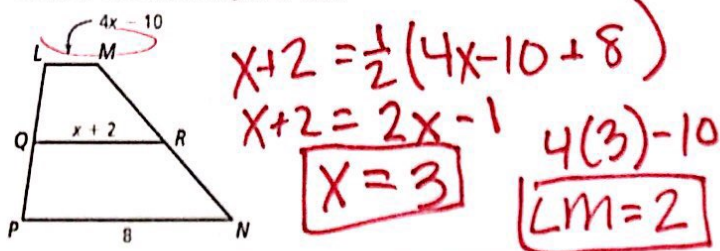
Example 5: CDEP is an isosceles trapezoid and $m\angle C = 65$. What are $m\angle D$, $m\angle E$, and $m\angle F$?



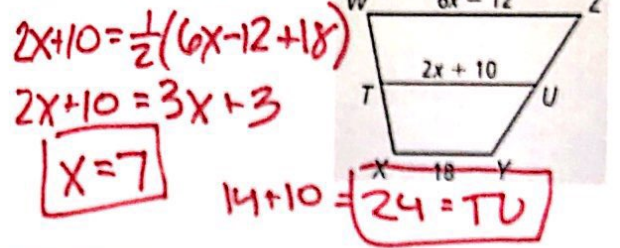
Example 6: What are the values of x and y in the isosceles triangle below if $DE \parallel BC$?



Example 7: QR is the midsegment of trapezoid LMNP. What is x and the length of LM?

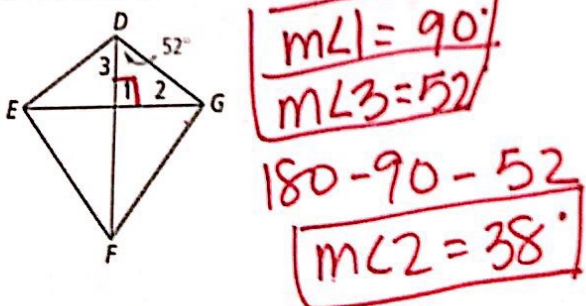


You Try! TU is the midsegment of trapezoid WXYZ. What is x and the length of TU?



Kite	<p>A kite is a quadrilateral with two pairs of adjacent, congruent sides.</p>	<p>Its diagonals are perpendicular.</p>	<p>Its diagonals bisect the opposite angles.</p>	<p>One pair of opposite angles are congruent.</p>	<p>One diagonal bisects the other.</p>

Example 4: Quadrilateral DEFG is a kite. What are $m\angle 1$, $m\angle 2$, and $m\angle 3$?



You Try! Quadrilateral KLMN is a kite. What are $m\angle 1$, $m\angle 2$, and $m\angle 3$?

