

[PACKET 5.6: KITES & TRAPEZOIDS]

Write your questions here!

Kites

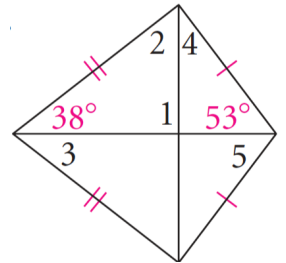
A kite is a quadrilateral with two pairs of consecutive sides congruent. The opposite sides are not congruent. Here are some examples:

We have one important theorem about kites:

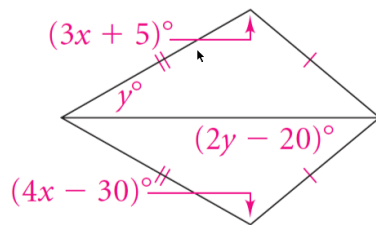
Then ...
 $\overline{AC} \perp \overline{BD}$

Example:

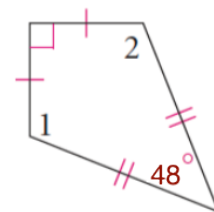
Find the unknown angles:



Solve for x and y:



Find $m\angle 1$ and $m\angle 2$.



$m\angle 1 =$

$m\angle 2 =$

Write your questions here!

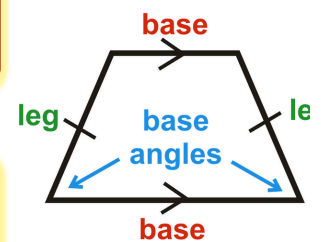
Trapezoids

A trapezoid is a quadrilateral with exactly one pair of parallel sides. The parallel sides are called bases. The two angles that share a common base of the trapezoid are called base angles. There are three types of trapezoids:

The nonparallel sides of a trapezoid are called legs. If the trapezoid has a right angle, it is called a _____. If the legs are congruent, the figure is called an _____.

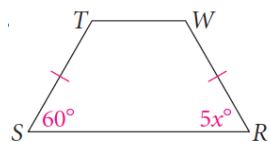
Theorem:

Theorem:



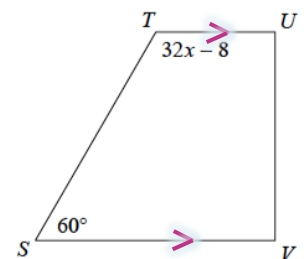
Trapezoid examples:

Solve for x:



$$SU = x + 1$$

$$TR = 2x - 3$$

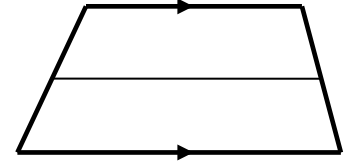


Write your questions here!

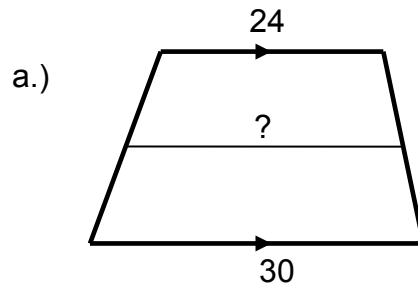
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Definition: The **midsegment** of a trapezoid (sometimes known as the median of the trapezoid) is _____.

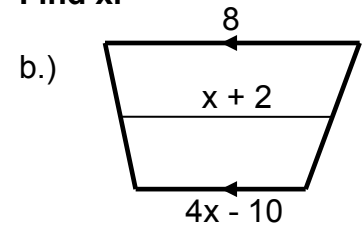
Trapezoid Midsegment Theorem:



Examples

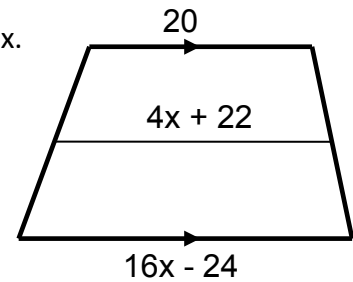


Find x.



You Try!

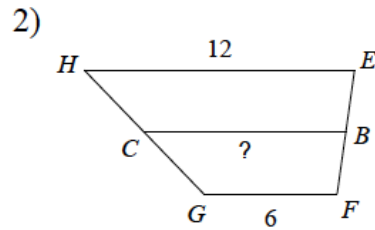
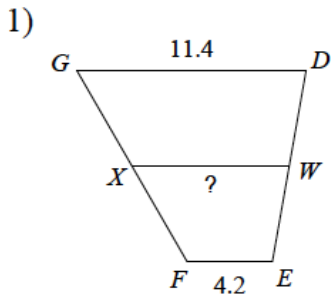
Solve for x.



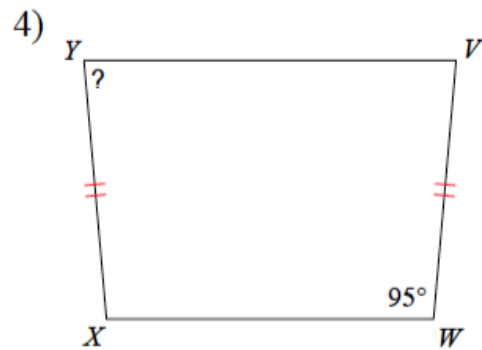
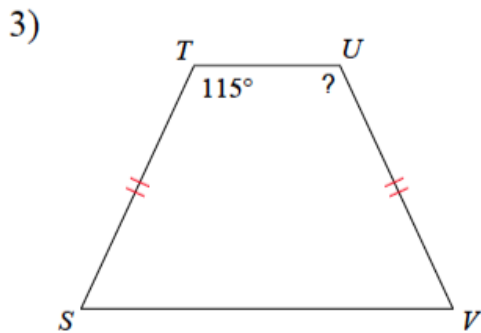
Now, summarize
your notes here!

5.6 Practice

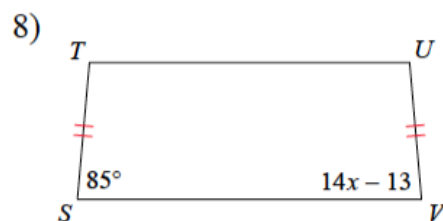
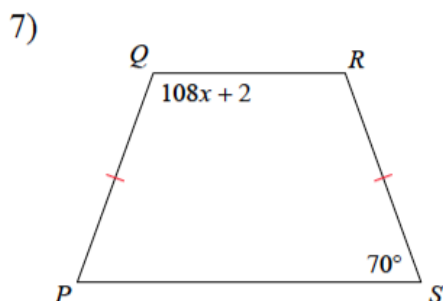
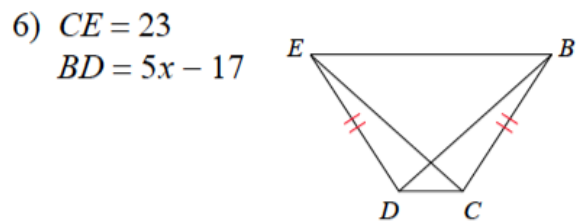
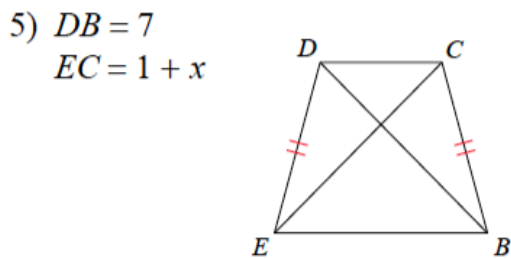
Find the length of the midsegment of each trapezoid.



Find the measurement of the angle indicated for each trapezoid.

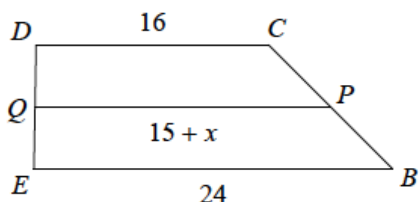


Solve for x . Each figure is a trapezoid.

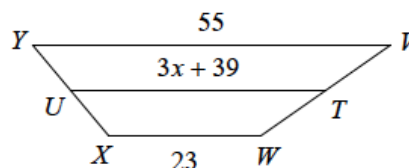


(Assume QP and UT are the midsegments of each trapezoid!)

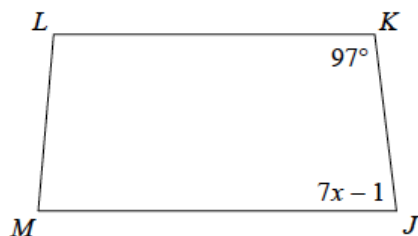
9)



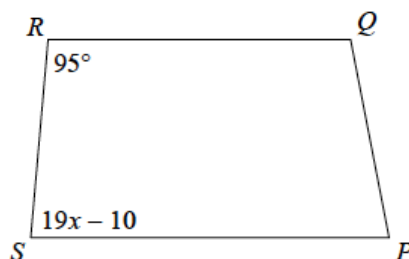
10)



11)

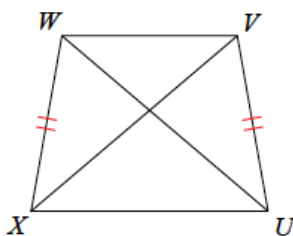


12)

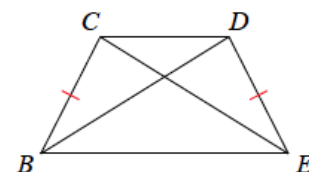


Find the length of the diagonal indicated for each trapezoid.

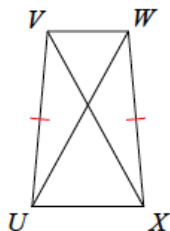
- 13) $WU = 3x - 18$
 $XV = 2x - 10$
 Find WU



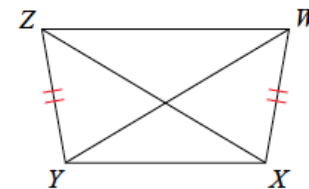
- 14) $CE = x + 5$
 $BD = 5x - 11$
 Find CE

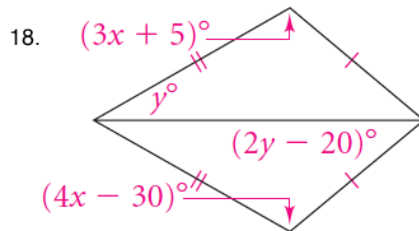
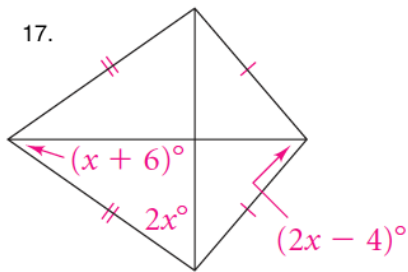


- 15) $VX = 2 + 2x$
 $UW = 5x - 19$
 Find VX



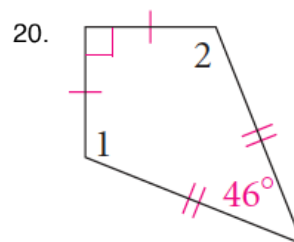
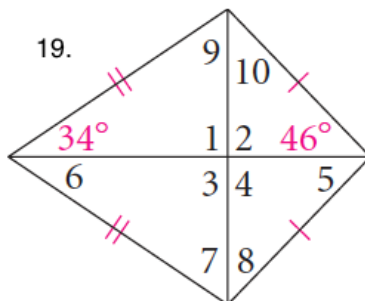
- 16) $XZ = 3x + 23$
 $WY = 4x + 23$
 Find XZ





Solve for x:

Find the measures of the numbered angles of each kite:



- $m \angle 1 =$ $m \angle 2 =$
 $m \angle 3 =$ $m \angle 4 =$
 $m \angle 5 =$ $m \angle 6 =$
 $m \angle 7 =$ $m \angle 8 =$
 $m \angle 9 =$ $m \angle 10 =$

- $m \angle 1 =$ $m \angle 2 =$

Solve each equation for x!

1. $\frac{5}{2x+1} = \frac{4}{x-4}$

2. $-2(4x - 2) - 2 = 4x - 4$

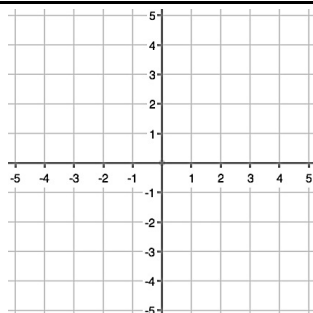
Multiply!

Factor!

3. $(x - 5)(2x - 7)$

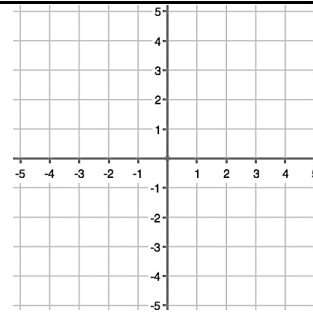
4. $2x^2 - 17x + 35$

5. Graph the equation:
 $y = 4 - 3x$



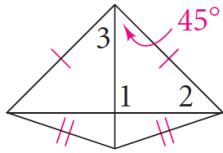
6. Graph the equation:

$x + y = 0$



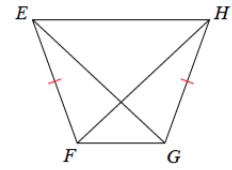
5.6 Application and Extension

1. $m \angle 1 =$
 $m \angle 2 =$
 $m \angle 3 =$



- 2.

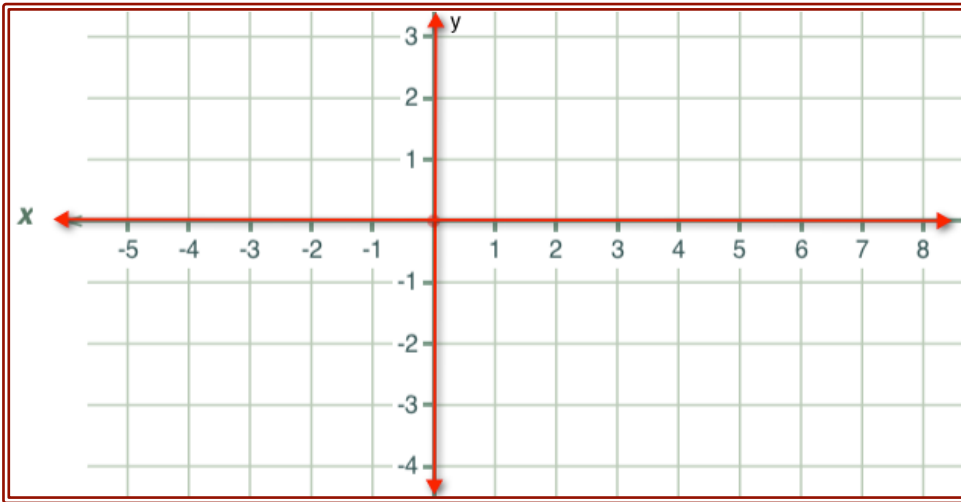
$HF = 2x + 18$
 $GE = x + 18$
 Find HF



3. The perimeter of a kite is sixty-six cm. The length of one of its sides is 3 cm less than twice of another. Draw a picture and find the length of each side of the kite.
4. What is the length of a midsegment of a trapezoid with bases of length 400 and 700?

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4. Graph quadrilateral FLIP with coordinates F(-3, 1), L(1, 2), I(7, 0) and P(-5, -3).



- a. Show FLIP is a trapezoid with exactly one pair of parallel sides.

Use $m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$.

- b. Find and plot the midpoint of \overline{FP} and the midpoint of \overline{LI} .

Use $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$.

- c. Find the length of the segment connecting those midpoints from part (b). Use $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

- d. Find the length of bases \overline{FL} and \overline{IP} using the distance formula.

- e. Using your answers from parts (c) and (d), show that the midsegment measures half the sum of the bases.

- f. Use the slope formula and your answer to part (a) to show that the midsegment is parallel to the bases.

- g. Use the coordinates you found in part (b) to write the equation of the line that runs through the midsegment of FLIP.