



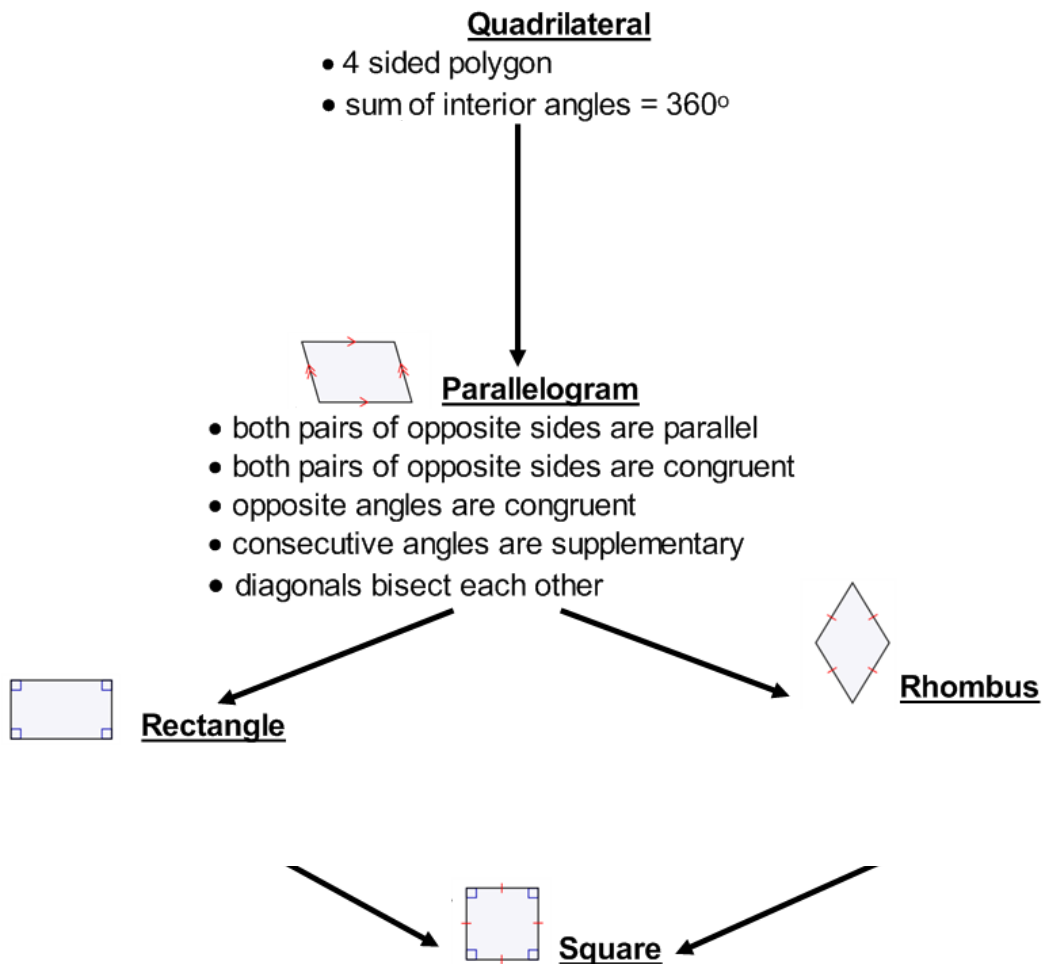
- I can use properties of rhombuses, rectangles, and squares.

**PLEASE WATCH THE FOLLOWING TWO VIDEOS TO HELP YOU FILL OUT THESE NOTES!**



Video #1: [https://youtu.be/\\_OR11uX7vsw](https://youtu.be/_OR11uX7vsw) (There's an underscore between the / and the O)

Video #2: <https://youtu.be/OhFebVkUzIk>

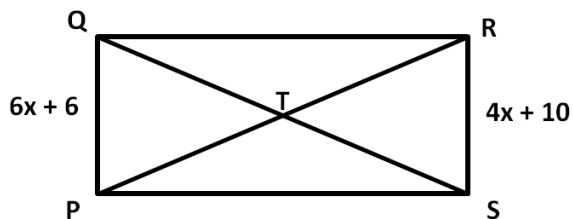
In the last section, we looked at properties of parallelograms. When we add extra characteristics to some angle measures or side lengths in parallelograms, we create some special parallelograms – the rectangle, rhombus, and square.



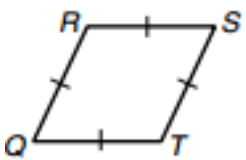
## Rectangles

Properties of Rectangles	
<p>A <b>rectangle</b> is a parallelogram with at least one right angle (all right angles!).</p> 	<p>If a parallelogram is a rectangle, then its diagonals are congruent.</p> 

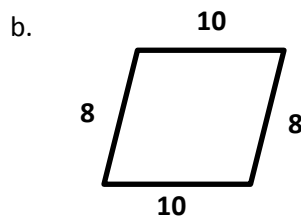
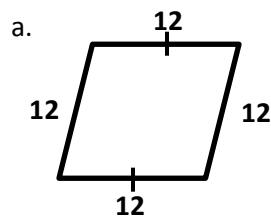
Example 1: In rectangle PQRS, if  $PQ = 6x + 6$ ,  $RS = 4x + 10$ ,  $QT = 3y - 2$  and  $PT = 7y - 14$ , and  $m\angle P = (6z + 18)^\circ$  solve for  $x$ ,  $y$  and  $z$ .



## Rhombus

Properties of Rhombuses		
<p>A <b>rhombus</b> is a parallelogram with at least 2 consecutive sides congruent (all sides congruent!).</p> 	<p>If a parallelogram is a rhombus, then its diagonals are perpendicular.</p>	<p>If a parallelogram is a rhombus, then each diagonal bisects a pair of opposite angles.</p>

Example 2: Is the following a rhombus?

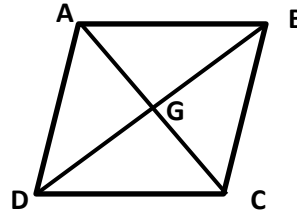


Example 3: Quadrilateral ABCD is a rhombus.

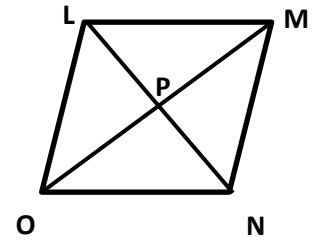
If  $m \angle ABC = 62^\circ$ , please find:

a.  $m \angle ADG =$  \_\_\_\_\_

b.  $m \angle DAB =$  \_\_\_\_\_



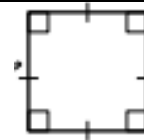
Example 4: Quadrilateral LMNO is a rhombus and its diagonals intersect at point P. If  $m \angle OPN = (8x + 2)^\circ$ , find the value of x.



### Square

#### Properties of Squares

A **square** is a parallelogram that is both equilateral and equiangular. A square has all of the properties of the rectangle and rhombus.

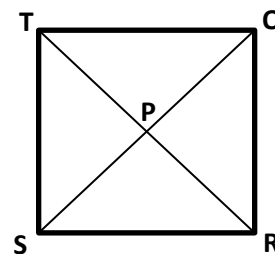


Example 5: Quadrilateral TQRS is a square and its diagonals intersect at point P.

a. Find  $m \angle TQR =$  \_\_\_\_\_.

b. Find  $m \angle RSP =$  \_\_\_\_\_.

c. Find  $m \angle RPQ =$  \_\_\_\_\_.

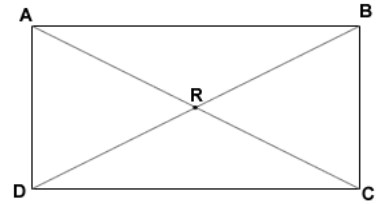


d. If  $ST = 7x + 3$  and  $TQ = 4x + 9$ , solve for x and find the perimeter of  $\square TQRS$ .

Try these!

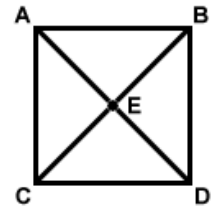
Use rectangle ABCD and the given information to solve problems #1 -3.

1. If  $AC = 4x - 60$  and  $BD = 30 - x$ , find BD.
2. If  $m\angle BAC = (4x + 5)^\circ$  and  $m\angle CAD = (5x - 14)^\circ$ , find  $m\angle CAD$ .
3. If  $AB = 3x + 5$  and  $CD = 40 - 2x$ , find the lengths of both segments.



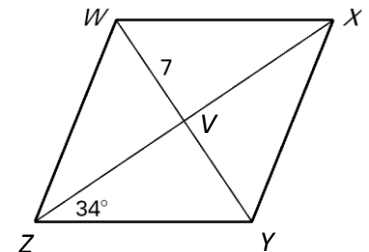
Use square ABCD and the given information to find each value in problems #4 – 6.

4. If  $AC = 2x + 4$  and  $CD = 3x - 5$ , find the perimeter of square ABCD.
5. If  $m\angle BAC = 9x^\circ$ , please solve for x.
6. If  $m\angle AEB = 3x^\circ$ , please solve for x.



The diagonals of rhombus WXYZ intersect at V. Given that  $m\angle XZY = 34^\circ$  and  $WV = 7$ , find the indicated measure in problems #7 – 10.

7.  $m\angle WZV$
8.  $m\angle XYZ$
9.  $WY$
10.  $XY$



**Answer Key:** 1.  $BD = 12$     2.  $41^\circ$     3.  $AB = 26, CD = 26$     4. Perimeter = 88 units    5.  $x = 10$   
6.  $x = 30$     7.  $34^\circ$     8.  $112^\circ$     9. 14    10. 12.5