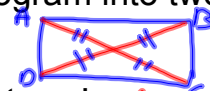


8-4 Rectangles

Rectangle-

- A quadrilateral with four right angles.
- It is a special parallelogram (both pairs of opposite angles are congruent).
- All Parallelogram Properties will apply.
 - **Opposite sides are congruent.
 - **Opposite angles are congruent.
 - **Consecutive angles are supplementary.
 - **Diagonals bisect each other.
 - **Each diagonal of a parallelogram separates the parallelogram into two congruent triangles.



If a parallelogram is a rectangle, $AC = BD$ then the diagonals are congruent.

Converse:

- **If the diagonals of a parallelogram are congruent, then it is a rectangle.

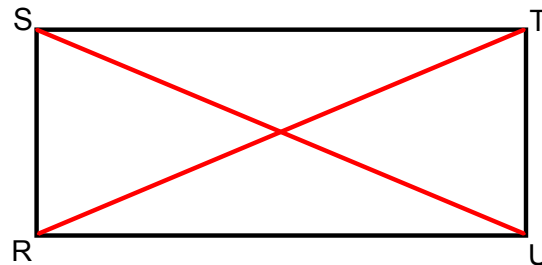
8-4 Rectangles

Example 1:

Quadrilateral RSTU is a rectangle.

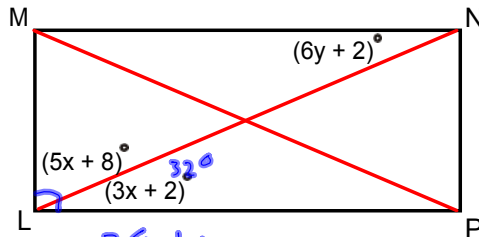
If $RT = 6x + 4$ and $SU = 7x - 4$, find x .

$$\begin{array}{r}
 RT = SU \\
 6x + 4 = 7x - 4 \\
 \underline{-6x \quad -6x} \\
 4 = x - 4 \\
 \underline{+4 \quad +4} \\
 8 = x
 \end{array}$$



Example 2:

Quadrilateral LMNP is a rectangle.
Find x and y.



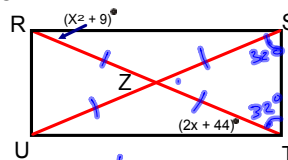
$$\begin{aligned} 5x + 8 + 3x + 2 &= 90 \\ 8x + 10 &= 90 \\ -10 &-10 \\ \hline 8x &= 80 \\ \frac{8x}{8} &= \frac{80}{8} \\ x &= 10 \end{aligned}$$

$$\begin{aligned} 3(10) + 2 &= 32 \\ 6y + 2 &= 32 \\ -2 &-2 \\ \hline 6y &= 30 \\ \frac{6y}{6} &= \frac{30}{6} \\ y &= 5 \end{aligned}$$

Example 3:

8-4 Rectangles

Quadrilateral RSTU is a rectangle.
Find x and angle SZT.



$$\begin{aligned} x^2 + 9 &= 2x + 44 \\ -2x &-2x \\ \hline x^2 - 2x + 9 &= 44 \\ -44 &-44 \\ \hline x^2 - 2x - 35 &= 0 \\ (x-7)(x+5) &= 0 \\ 5x - 7x = -2x & \\ x-7=0 & \quad x+5=0 \\ x=7 & \quad x=-5 \end{aligned}$$

$$\begin{aligned} x &= 7 \\ 2(7) + 44 &= 58^\circ \\ 90 - 58 &= 32^\circ \\ 32 + 32 &= 64 \\ 180 - 64 &= 116^\circ \\ \text{m}\angle \text{SZT} &= 116^\circ \end{aligned}$$

$$\begin{aligned} x &= -5 \\ 2(-5) + 44 &= 34 \\ 90 - 34 &= 56 \\ 56 + 56 &= 112 \\ 180 - 112 &= 68^\circ \\ \text{m}\angle \text{SZT} &= 68^\circ \end{aligned}$$