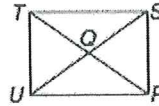


Rectangle Notes

Properties of Rectangles A rectangle is a quadrilateral with four right angles. Here are the properties of rectangles.



A rectangle has all the properties of a parallelogram.

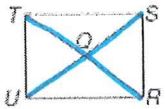
- Opposite sides are parallel.
- Opposite angles are congruent.
- Opposite sides are congruent.
- Consecutive angles are supplementary.
- The diagonals bisect each other.

Also:

- All four angles are right angles. $\angle UTS, \angle TSR, \angle SRU,$ and $\angle RUT$ are right angles.
- The diagonals are congruent. $\overline{TR} \cong \overline{US}$

Example 1 In rectangle $RSTU$ above, $US = 6x + 3$ and $RT = 7x - 2$. Find x .

Example 2 In rectangle $RSTU$ above, $m\angle STR = 8x + 3$ and $m\angle UTR = 16x - 9$. Find $m\angle STR$.



$RT \cong US$ diagonals of a rectangle are \cong
 $7x - 2 = 6x + 3$
 $x = 5$



$\angle STU = 90^\circ$ def of rectangle
 $\angle STU = \angle STR + \angle UTR$ angle addition

$$90 = 8x + 3 + 16x - 9$$

$$4 = x$$

$$m\angle STR = 8x + 3$$

$$m\angle STR = 8(4) + 3$$

$$m\angle STR = 35^\circ$$

3. If $\overline{AE} = 3x + 3$ and $\overline{EC} = 5x - 15$, find AC .



$\overline{AE} \cong \overline{EC}$ diagonals of a rectangle bisect each other
 $3x + 3 = 5x - 15$
 $9 = x$

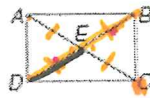
$AC = \overline{AE} + \overline{EC}$ Seg. addition

$$AC = 3x + 3 + 5x - 15$$

$$AC = 3(9) + 3 + 5(9) - 15$$

$$AC = 60$$

4. If $\overline{DE} = 6x - 7$ and $\overline{AE} = 4x + 9$, find DB .



$\overline{DE} \cong \overline{AE}$ diagonals of a rectangle are \cong and bisect each other
 $6x - 7 = 4x + 9$
 $x = 8$

$$DB = 2 \overline{DE}$$

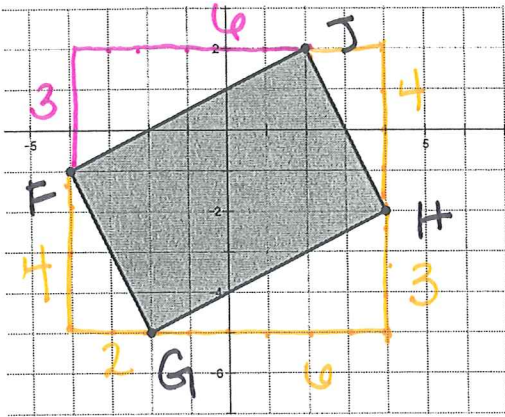
$$DB = 2(6 \cdot 8 - 7)$$

$$DB = 82$$

5. Determine whether the figure with vertices $F(-4,-1)$, $G(-2,-5)$, $H(4,-2)$ and $J(2,2)$ is a rectangle.

To be a rectangle, you must test for 4 Right angles

Perpendicular Slopes



$$\text{Slope } JH = -\frac{4}{2} = -2$$

$$\text{Slope of } FG \text{H} = \frac{3}{6} = \frac{1}{2} \quad \perp$$

$$\text{Slope of } FG = -\frac{4}{2} = -2 \quad \perp$$

$$\text{Slope of } JF = \frac{3}{6} = \frac{1}{2} \quad \perp$$

all consecutive sides are
Perpendicular so it has
4 right \angle s \therefore FJHG is
a rectangle by definition