## Content Objective: I will be able to apply properties of parallelograms and rectangles to determine the measures of sides, diagonals, and/or angles.

| TERM | DESCRIPTION | EXAMPLE |
| :---: | :---: | :---: |
| QUADRILATERAL | A closed figure formed by $\qquad$ segments $\overline{\text { intersecting }}$ at their endpoints. |  |
| PARALLELOGRAM | A quadrilateral in which opposite sides are $\qquad$ |  |
| RECTANGLE | A parallelogram with four $\qquad$ angles. |  |
| DIAGONAL | Segment joining $\qquad$ vertices in a polygon |  |

EXAMPLE 1: Refer to the figure on the right to identify or name each of the following:
a. The four vertices are $\qquad$ .
b. The name of the rectangle is $\qquad$ .
c. The opposite sides are $\qquad$ .
d. The opposite angles are $\qquad$ .
e. The consecutive angles are $\qquad$ .
f. The diagonals are $\qquad$ .


## EXAMPLE 2:

a. Name the diagonals of rectangle LMNO: $\qquad$ and $\qquad$
b. Use the distance formula to find the lengths of these diagonals:

$$
d=\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}}
$$


$\qquad$
$\qquad$
$\qquad$ .

Label the figure to represent each of the properties listed below:
PROPERTIES OF RECTANGLES

1. Opposite sides are $\qquad$ .
2. Opposite sides $\qquad$ .
3. Opposite angles $\qquad$ .
4. Consecutive angles $\qquad$ .
5. Diagonals $\qquad$ each other.

* 6. Four $\qquad$ angles.
*7. Diagonals are $\qquad$ .


For Examples \# 3-5, set up and solve an equation to determine the value of $\boldsymbol{x}$.
EXAMPLE 3: Quadrilateral MNOP is a rectangle. $M O=2 x-8$ and $N P=23$.

$x=$ $\qquad$

QUICK CHECK: Quadrilateral QRST is a rectangle. $\mathbf{Q S}=3 x-2$ and $\mathbf{R T}=48-2 x$.
$x=$ $\qquad$


-     -         -             -                 -                     -                         -                             -                                 -                                     -                                         -                                             -                                                 -                                                     -                                                         -                                                             -                                                                 -                                                                     -                                                                         -                                                                             -                                                                                 -                                                                                     -                                                                                         - .

EXAMPLE 4: Quadrilateral $\mathbf{A B C D}$ is a rectangle. $\mathbf{A C}=4 \mathrm{x}-13$ and $\mathbf{D P}=\mathrm{x}+7$.

$x=$ $\qquad$

QUICK CHECK: Quadrilateral RWST is a rectangle. If $\mathbf{R Z}=2 x+5$ and TW $=5 x-20$.

$X=$ $\qquad$

EXAMPLE 5: Quadrilateral RSTU is a rectangle. If $\mathbf{m} \angle \mathbf{R S U}=(3 x-5)^{\circ}$ and $\mathbf{m} \angle \mathbf{U S T}=(4 x+4)^{\circ}$.

$X=$ $\qquad$

QUICK CHECK: Quadrilateral LMNO is a rectangle. If $\angle \mathrm{LMN}=(11 \mathrm{x}+35)^{\circ}$.

$\mathrm{X}=$ $\qquad$

