

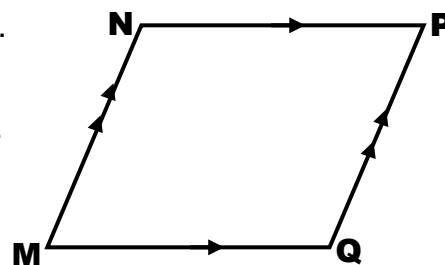
Notes: PARALLELOGRAMS

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

TERM	DESCRIPTION	EXAMPLE
QUADRILATERAL	A closed figure formed by _____ segments intersecting at their endpoints.	
PARALLELOGRAM	A quadrilateral in which opposite sides are _____.	
DIAGONAL	Segment joining _____ vertices in a polygon	

EXAMPLE 1: *Refer to the figure on the right to identify or name each of the following:*

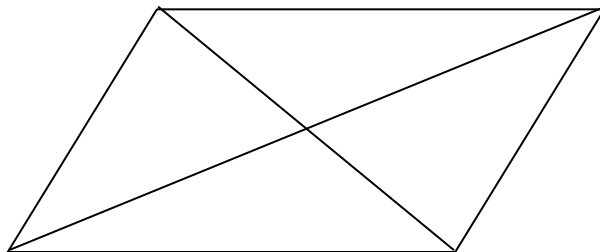
- The four vertices are _____.
- The name of the parallelogram is _____.
- The opposite sides are _____.
- The opposite angles are _____.
- The consecutive angles are _____.
- The diagonals are _____.



Label the figure to represent each of the properties listed below:

PROPERTIES OF PARALLELOGRAMS

1. Opposite sides are _____, therefore they have the _____ slope.
2. Opposite sides are _____.
3. Opposite angles are _____.
4. Consecutive angles are _____.
5. Diagonals _____ each other.



For Example # 2, draw and label each parallelogram described then determine the value of x .

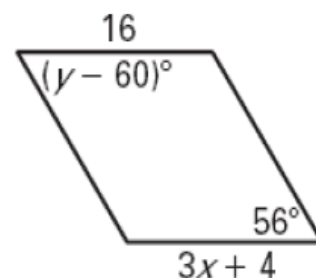
EXAMPLE 2: If $ABCD$ is a parallelogram, $m\angle A = x^\circ$ and $m\angle D = (2x - 3)^\circ$.

$$x = \underline{\hspace{2cm}}$$

QUICK CHECK: If $ABCD$ is a parallelogram, $m\angle D = x^\circ$ and $m\angle A = (3x + 4)^\circ$.

$$x = \underline{\hspace{2cm}}$$

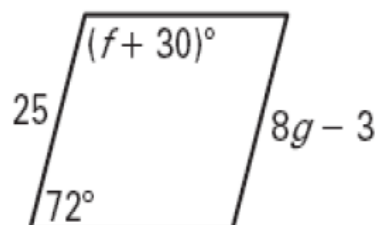
EXAMPLE 3: Use the parallelogram to find the indicated values.



$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$

QUICK CHECK: Use the parallelogram to find the indicated values.



$$f = \underline{\hspace{2cm}}$$

$$g = \underline{\hspace{2cm}}$$

For Example # 4, draw and label each parallelogram described then determine the value of x .

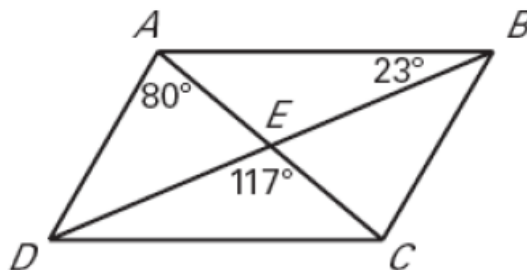
EXAMPLE 4: $XYZW$ is a parallelogram with diagonals \overline{XZ} and \overline{YW} that intersect at point A .
If $XA = 3m$ and $ZA = 5m - 4$, find m .

$$m = \underline{\hspace{2cm}}$$

QUICK CHECK: $XYZW$ is a parallelogram with diagonals \overline{XZ} and \overline{YW} that intersect at point A .
If $YA = 2t$ and $WA = 3t - 4$, find YA .

$$t = \underline{\hspace{2cm}}$$

EXAMPLE 5: Use parallelogram $ABCD$ to find the indicated values.



$$m \angle AEB = \underline{\hspace{2cm}}^\circ$$

$$m \angle BAD = \underline{\hspace{2cm}}^\circ$$

$$m \angle BAE = \underline{\hspace{2cm}}^\circ$$

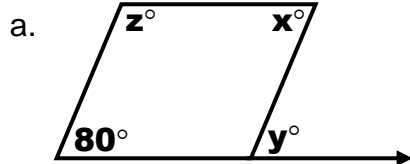
$$m \angle DCE = \underline{\hspace{2cm}}^\circ$$

$$m \angle AED = \underline{\hspace{2cm}}^\circ$$

$$m \angle ADC = \underline{\hspace{2cm}}^\circ$$

$$m \angle ECB = \underline{\hspace{2cm}}^\circ$$

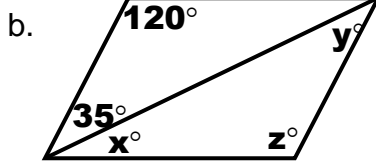
$$m \angle DCB = \underline{\hspace{2cm}}^\circ$$

EXAMPLE 6: For each parallelogram, find the values of x , y , and z .

$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$

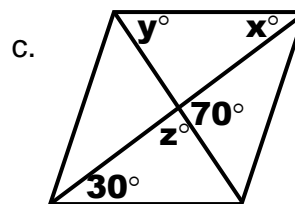
$$z = \underline{\hspace{2cm}}$$



$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$

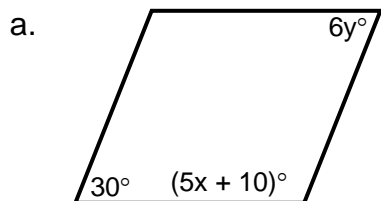
$$z = \underline{\hspace{2cm}}$$



$$x = \underline{\hspace{2cm}}$$

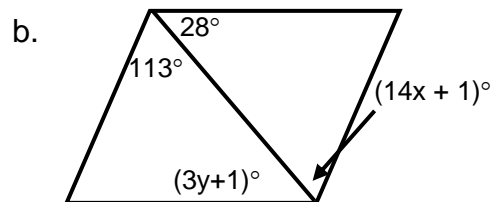
$$y = \underline{\hspace{2cm}}$$

$$z = \underline{\hspace{2cm}}$$

QUICK CHECK: Find the values of x and y to ensure that each quadrilateral is a parallelogram.

$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$



$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$