

## TOPIC 10-1: PARALLELOGRAMS

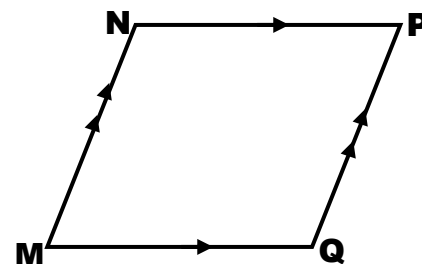
**Video Intro:** <http://www.youtube.com/watch?v=rXZcYHVwkqI>

**Brainstorm:** What do you already know about a Quadrilateral?

A parallelogram is a specific type of Quadrilateral.

What conjectures can you make about  $\square$ MNPQ?

- By definition, opposite sides are \_\_\_\_\_.
- Because parallel lines are equidistant, opposite sides are \_\_\_\_\_.
- Because they are same-side interior angles, consecutive angles are \_\_\_\_\_.
- Opposite angles are \_\_\_\_\_.



When polygons have more than three sides, they have diagonals.

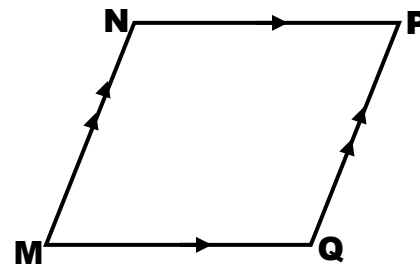
So when we are learning about the many properties of quadrilaterals – **DIAGONALS** will be involved and important.

In fact, many of the diagrams and pictures we use will have the diagonals marked for you. If not, you will need to draw them!

**Practice Naming Parts.....**

a) The parallelogram at the right has four vertices. They are:

\_\_\_\_\_



b) It would be NAMED: \_\_\_\_\_

c) The OPPOSITE SIDES of  $\square$  MNPQ are: \_\_\_\_\_

d) The OPPOSITE ANGLES of  $\square$  MNPQ are: \_\_\_\_\_

e) The CONSECUTIVE ANGLES of  $\square$  MNPQ are \_\_\_\_\_

\_\_\_\_\_

f) The DIAGONALS of  $\square$  MNPQ are: \_\_\_\_\_

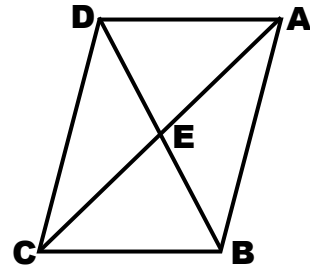


So...parallelograms have FIVE properties. They are:

<p><b>1. Opposite sides are _____.</b></p>	
<p><b>2. Opposite sides are _____.</b></p>	
<p><b>3. Opposite angles are _____.</b></p>	
<p><b>4. _____ angles are _____.</b></p>	
<p><b>5. Diagonals _____ each other.</b></p>	

## Name the Parts.....Take Two.....

a) Name the parallelogram: \_\_\_\_\_

b)  $\overline{AB} \parallel \parallel$  \_\_\_\_\_c)  $\overline{DA} \cong$  \_\_\_\_\_d)  $\angle CDA \cong$  \_\_\_\_\_e)  $\overline{DE} \cong$  \_\_\_\_\_**EXAMPLE 1**

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

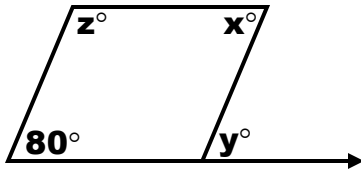
**EXAMPLE 2**

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

**EXAMPLES**

For each parallelogram, find the values of 'x', 'y', and 'z'.

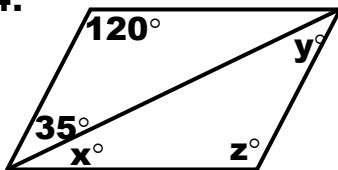
3.



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

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

4.



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

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