

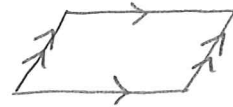
Section 8.2: Use Properties of Parallelograms

Essential Question:

How do you find angle measures and side measures in a parallelogram?

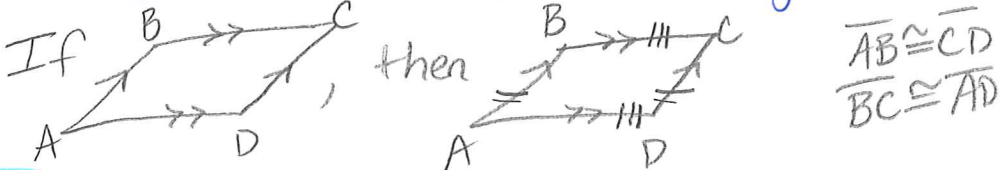
VOCABULARY:

Parallelogram A quadrilateral with both pairs of opposite sides parallel



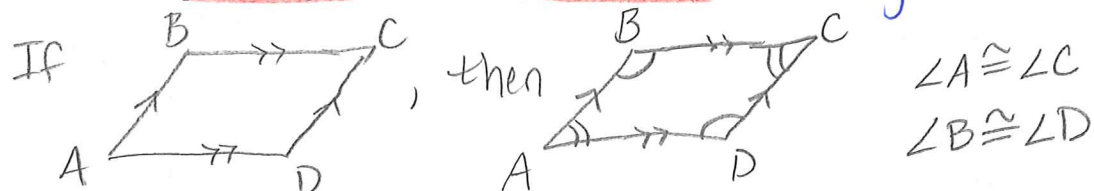
Theorem 8.3:

If a quadrilateral is a parallelogram, then its opposite sides are congruent.

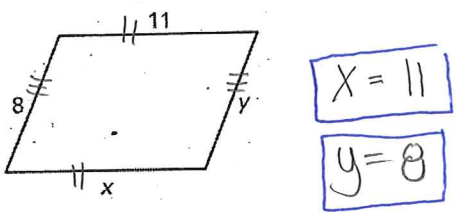


Theorem 8.4:

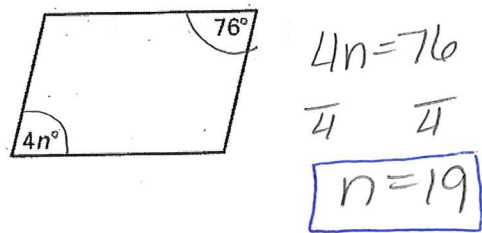
If a quadrilateral is a parallelogram, then its opposite angles are congruent.



A1. Find the value of each variable in the parallelogram.

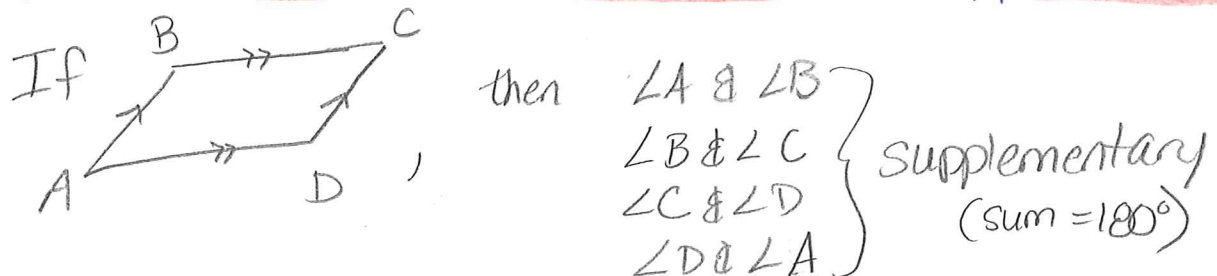


A2. Find the value of n in the parallelogram.



Theorem 8.5:

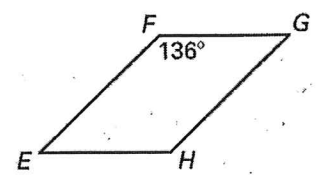
If a quadrilateral is a parallelogram, then its consecutive angles are supplementary.



A3. Find the measures of the three missing angles in the parallelogram.

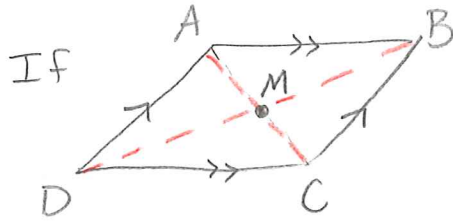
Thm 8.5 $\angle F + \angle G = 180$
 $136 + \angle G = 180$
 -136
 $m\angle G = 44^\circ$

$m\angle E = 44^\circ$ Thm 8.4
 $m\angle H = 136^\circ$



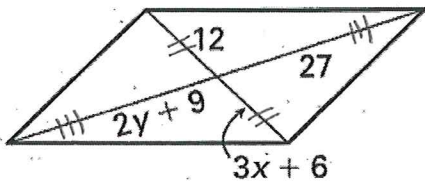
Theorem 8.6:

If a quadrilateral is a parallelogram, then its diagonals bisect each other. → cut in half



then $AM = CM$
 $DM = BM$

A4. Find value of the variables in the parallelogram.



Thm 8.6

$$2y + 9 = 27$$

$$\quad \quad -9$$

$$2y = 18$$

$$\quad \quad \div 2$$

$$y = 9$$

$$3x + 6 = 12$$

$$\quad \quad -6$$

$$3x = 6$$

$$\quad \quad \div 3$$

$$x = 2$$

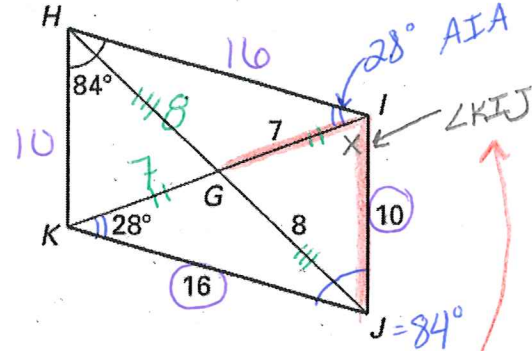
A5. Give the indicated measure in parallelogram $HIJK$ and your reason.

a. $HI = 16 \text{ un}$ Thm 8.3
opp. sides \cong

b. Perimeter of $HIJK$
 $16 + 16 + 10 + 10$
 $= 52 \text{ un}$

Thm 8.3

c. $m\angle KIJ$
Thm 8.5
 $= 68^\circ$



$$\angle I + \angle J = 180 \quad (\text{Thm 8.5})$$

$$28 + x + 84 = 180$$

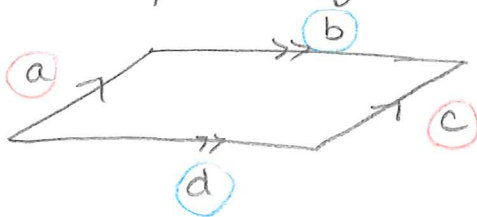
$$x + 112 = 180$$

$$\quad \quad -112$$

$$x = 68^\circ$$

Summary 8.2:

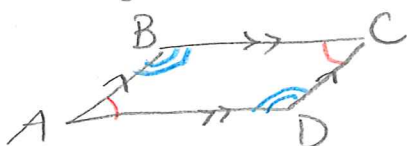
* In a parallelogram opposite sides are congruent.



$$a = c$$

$$b = d$$

* In a parallelogram opposite angles are congruent and consecutive angles are supplementary.



- $\angle A \cong \angle C$
- $\angle B \cong \angle D$

and

$$\angle A + \angle B = 180$$

$$\angle B + \angle C = 180$$

$$\angle C + \angle D = 180$$

$$\angle A + \angle D = 180$$