

# STATION 1

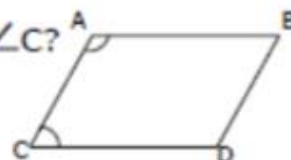
Complete all the problems. Make sure to draw pictures to help you solve the problems.

1. Find if both pairs of opposite sides are parallel in this parallelogram? *Yes by the markings given.*

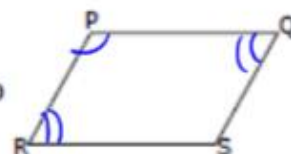


2.  $\square ABCD$  is a parallelogram. Find the sum of  $\angle A$  and  $\angle C$ ?

$\square \rightarrow$  consecutive  $\angle$ 's supp.  
 $m\angle A + m\angle C = 180^\circ$

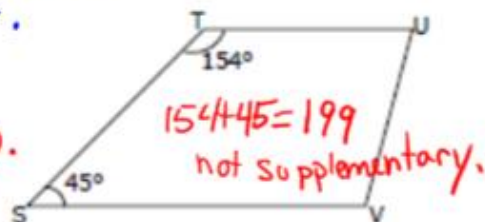


3.  $\square PQRS$  is a parallelogram. If angle  $\angle P$  and  $\angle R$  are supplementary angle, then find if  $\angle Q$  is supplementary to  $\angle P$  and  $\angle R$  both?  $\angle Q$  is supplementary to  $\angle P$  and congruent to  $\angle R$  because  $\square \rightarrow$  opp.  $\angle$ 's are  $\cong$ .



4. Is STUV a parallelogram?

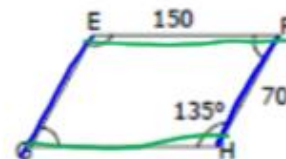
*No because  $\angle S$  and  $\angle T$  are not supp. and  $\square \rightarrow$  consecutive  $\angle$ 's are supp.*



5. Is  $\angle S$  and  $\angle T$  are supplementary angles?

**NO**

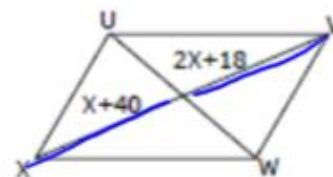
6. What is the length of side  $\overline{EG}$  and side  $\overline{GH}$  in parallelogram EFGH? *opp. sides  $\cong$*   
 $m\overline{EG} = 70$   $m\overline{GH} = 150$



7. What is the measure of  $\angle E, \angle F, \angle G$  in parallelogram? *angles*  $\angle F + \angle H$  are supp.  
 $m\angle E = 135^\circ$   $m\angle F = 180 - 135 = 45^\circ$   $m\angle G = 45^\circ$

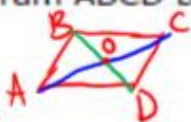
8.  $\square UVWX$  is a parallelogram. What is the value of  $x$ ?

*Diagonals bisect*  $2x + 18 = x + 40 \rightarrow x + 18 = 40 \rightarrow x = 22$



9. If the diagonals of a parallelogram ABCD bisect each other then  $\overline{AO} = \overline{OD}, \overline{CO} = \overline{OB}$ ?

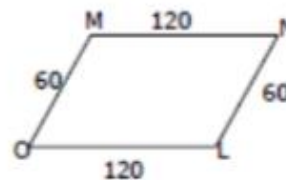
*No  $\overline{AO} \cong \overline{CO}, \overline{BO} \cong \overline{DO}$*



10. Is  $\square MNLO$  a parallelogram?



*Yes opp sides are  $\cong$*



# STATION 2

Draw a picture of each quadrilateral, to determine if it is a parallelogram by one of the following reasons. Be able to explain your selection.

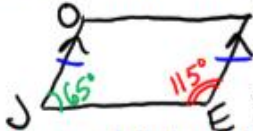
- Opposite sides congruent.
- Opposite angles congruent.
- Diagonals bisect each other.
- One pair of opposite sides is both parallel and congruent.
- Both pairs of opposite sides are parallel.

21) In quadrilateral BLOT,  $\overline{BL} \parallel \overline{TO}$ ,  $m\angle BTO = 80^\circ$ , and  $m\angle LOT = 100^\circ$



Yes because opposite angles are congruent

22) In quadrilateral JOKE,  $\overline{JO} \cong \overline{EK}$ ,  $m\angle OJE = 65^\circ$ , and  $m\angle JEK = 115^\circ$ .



Converse of same side int. angles Thm.

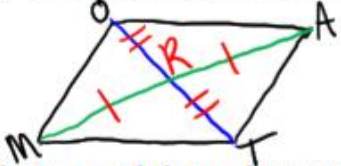
Yes because one pair of opposite sides is both parallel and congruent.

23) In quadrilateral SLOW,  $\overline{SL} \cong \overline{LO} \cong \overline{OW} \cong \overline{SW}$ .



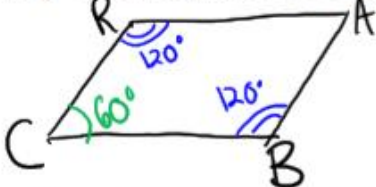
Yes because opp. sides are congruent

24) In quadrilateral MOAT,  $\overline{MA}$  intersects  $\overline{OT}$  at R,  $\overline{MR} \cong \overline{RA}$ , and  $\overline{TR} \cong \overline{OR}$ .



Yes because diagonals bisect each other

25) In quadrilateral CRAB,  $m\angle RCB = 60^\circ$ ,  $m\angle CBA = 120^\circ$ , and  $m\angle CRA = 120^\circ$ .



Yes because opp. angles are congruent

Sum of interior angles of a parallelogram is  $360^\circ$  so  $m\angle A = 60^\circ$ .

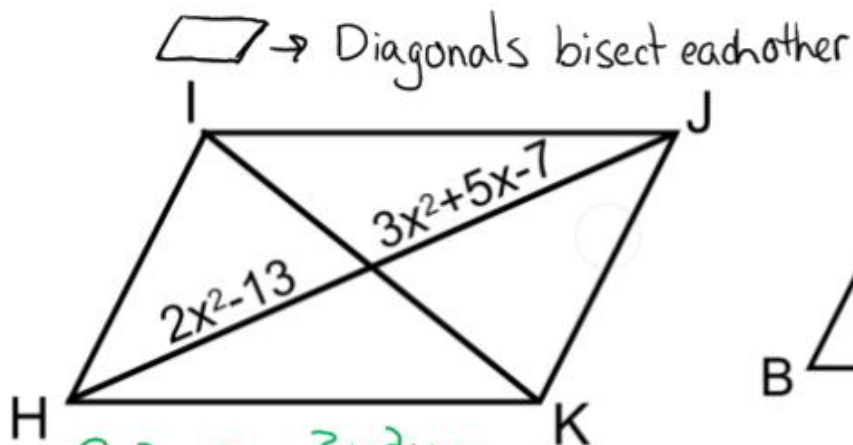
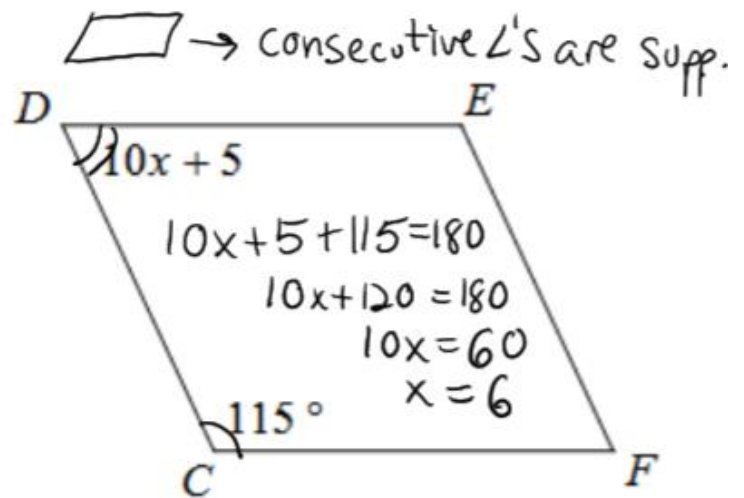
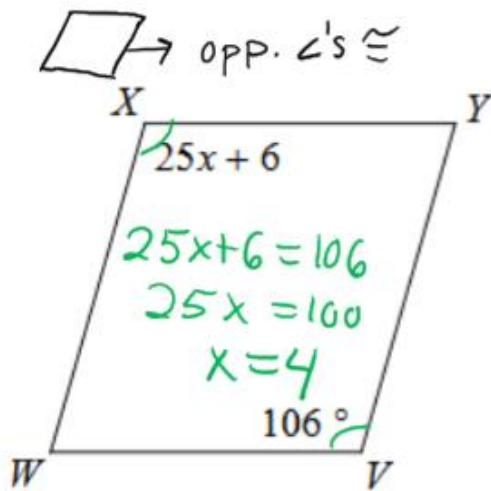
$$120 + 120 + 60 + m\angle A = 360$$

$$300 + m\angle A = 360$$

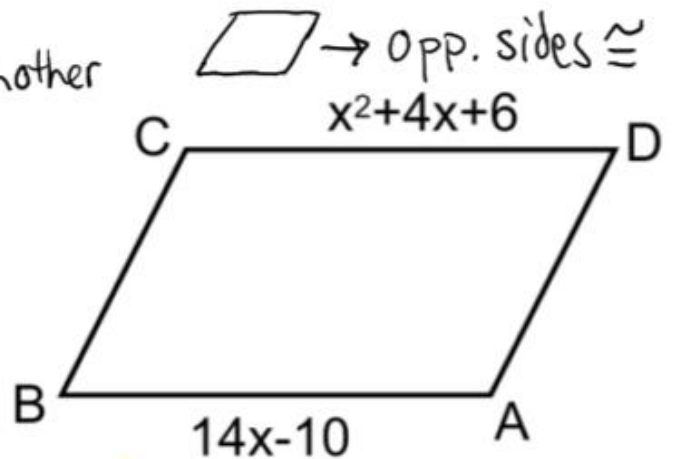
$$m\angle A = 60^\circ$$

# STATION 3

Each of the following are parallelograms. Find the value of the x in each figure.



$2x^2-13 = 3x^2+5x-7$   
 $-13 = x^2+5x-7$   
 $0 = x^2+5x+6$   ~~$\frac{6}{2}$~~   
 $0 = (x+3)(x+2)$   
 $x+3=0$     $x+2=0$   
 $x = -3$     $x = -2$



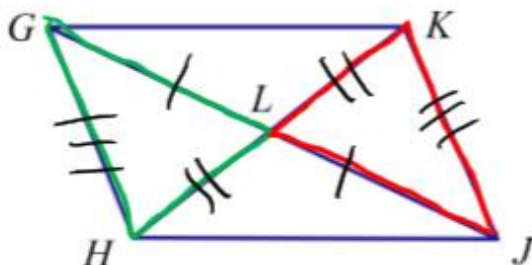
$x^2+4x+6 = 14x-10$   
 $x^2-10x+6 = -10$   ~~$\frac{16}{-2}$~~   
 $x^2-10x+16 = 0$   ~~$\frac{-8}{-2}$~~   
 $(x-8)(x-2) = 0$   
 $x-8=0$     $x-2=0$   
 $x=8$     $x=2$    both will work

# STATION 4

Prove the following using the properties of parallelograms.

**Given:** Parallelogram GHJK

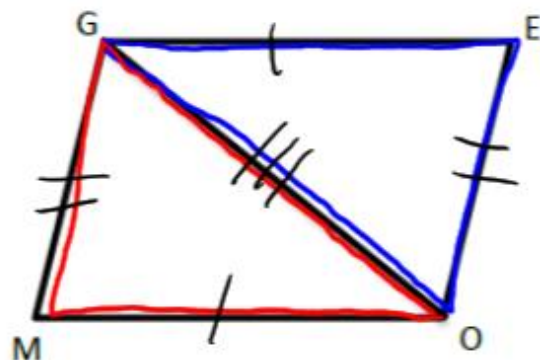
**Prove:**  $\triangle GLH \cong \triangle JLK$



Statement	Reason
GHJK is a $\square$	Given
$\overline{GL} \cong \overline{JL}$ & $\overline{HL} \cong \overline{KL}$	$\square \rightarrow$ Diagonals bisect each other
$\overline{GH} \cong \overline{JK}$	$\square \rightarrow$ opp. sides are $\cong$
$\triangle GLH \cong \triangle JLK$	SSS

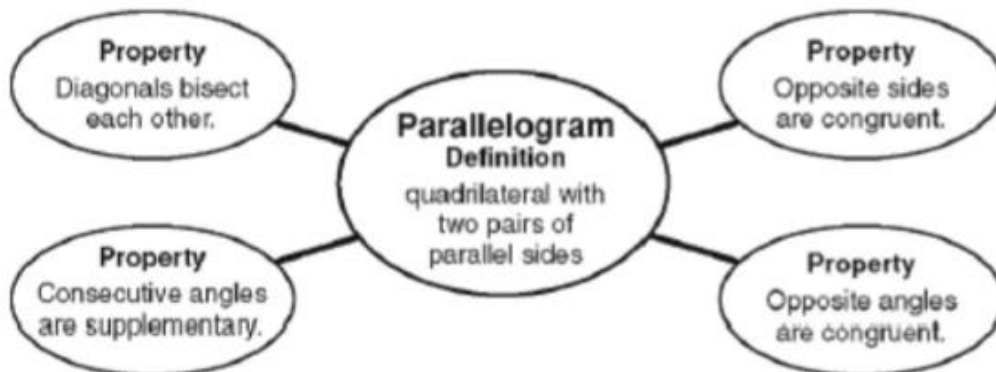
**Given:**  $\square$  GEOM

**Prove:**  $\triangle GEO \cong \triangle OMG$



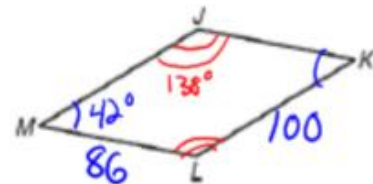
Statement	Reason
GEOM is a $\square$	Given
$\overline{GE} \cong \overline{OM}$ & $\overline{EO} \cong \overline{MG}$	$\square \rightarrow$ opp. sides $\cong$
$\overline{OG} \cong \overline{GO}$	Reflexive Property
$\triangle GEO \cong \triangle OMG$	SSS

# STATION 5



Use the graphic aid above to help answer Problems 1–10.

In  $\square JKLM$ ,  $LM = 86$  millimeters,  $LK = 100$  millimeters, and  $m\angle JML = 42^\circ$ . Find each measure.



1.  $JM$

100

2.  $m\angle KJM$

$m\angle KJM = 180 - 42 = 138^\circ$

3.  $KL$

86

4.  $m\angle LKJ$

$42^\circ$

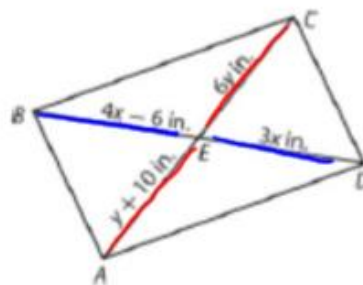
5.  $m\angle MLK$

$138^\circ$

Use  $\square ABCD$  to find each measure.

$$\begin{aligned} y+10 &= 6y \\ 10 &= 5y \\ y &= 2 \end{aligned}$$

$$\begin{aligned} 4x-6 &= 3x \\ -6 &= -x \\ x &= 6 \end{aligned}$$



$\square \rightarrow$  Diagonals bisect each other

6.  $AE$

$m\overline{AE} = (2)+10 = 12 \text{ in.}$

7.  $BE$

$m\overline{BE} = 4(6) - 6 = 18 \text{ in.}$

8.  $CE$

$m\overline{CE} = 6(2) = 12 \text{ in.}$

9.  $\overline{AC} = AE + CE = 12 + 12$

$m\overline{AC} = 24 \text{ in.}$

10.  $BD = BE + DE = 18 + 18$

$m\overline{BD} = 36$