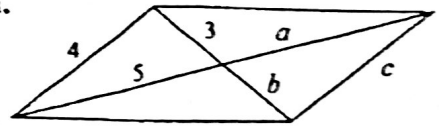
Lesson 3

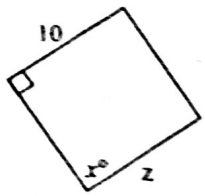
Find the value of each variable in the parallelogram.

a.



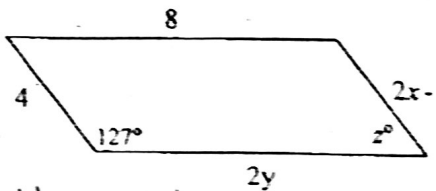
Diagonals bisect each other
$a=5$, $b=3$
Opposite sides $\cong$
$c=4$

b.



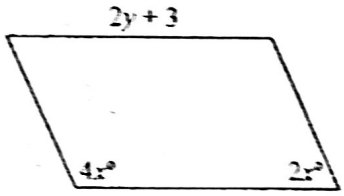
Consecutive $\angle$s are supplementary
$x+90=180$ $x=90°$
Opposite sides $\cong$
$z=10$

c.



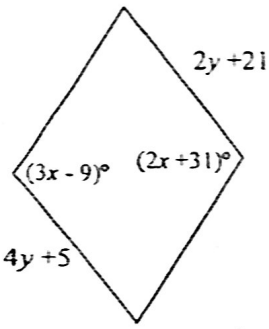
Opposite sides $\cong$
$2x-6=4$ $x=5$
$2y=8$ $y=4$
Consecutive $\angle$s are supplementary
$z+127=180$ $z=53°$

d.



Consecutive $\angle$s are supplementary
$4x+2x=180$ $x=30°$
Opposite sides $\cong$
$2y+3=y+9$ $y=6$

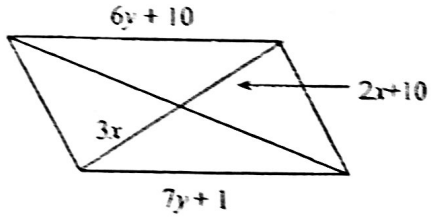
e.



Opposite $\angle$s $\cong$
$3x-9=2x+31$ $x=40°$

Opposite sides $\cong$
$4y+5=2y+21$
$y=8$

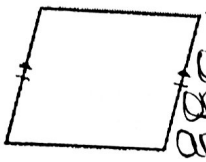
f.

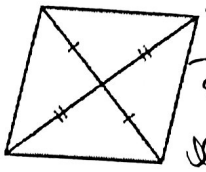


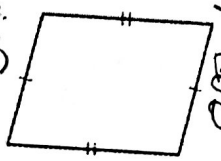
Diagonals bisect each other
$3x=2x+10$ $x=10$

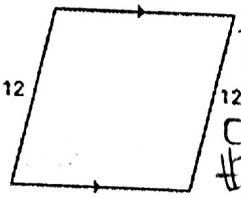
Opposite sides $\cong$
$6y+10=7y+1$ $y=9$

Are you given enough information to determine whether the quadrilateral is a parallelogram? Explain.

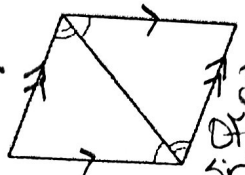
1. 
Yes - one pair of opp sides are both // and ≅

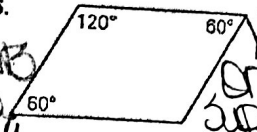
2. 
Yes ~ Diagonals bisect each other

3. 
Yes ~ Both pairs of opposite sides are ≅

4. 

No - Not same pair of sides that are // and ≅

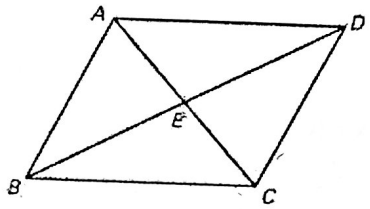
5. 
Yes ~ Both pairs of opposite sides are //

6. 

Yes ~ One ∠ is supplementary to both of its consecutive ∠'s

Decide whether each piece of given information alone is sufficient to prove that quadrilateral *ABCD* is a parallelogram.

7. E is the midpoint of $\overline{AC}$ and $\overline{BD}$.
8. $m\angle ABC + m\angle BCD = 180°$
9. $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \cong \overline{DA}$
10. $\angle ABC \cong \angle ADC$, and $\angle BAD \cong \angle BCD$
11. $\triangle ABE \cong \triangle DCE$
12. $\triangle ABE \cong \triangle CDE$



7) Yes ~ Diagonals bisect each other
8) NO
9) NO ~ not same pair of sides that are // and ≅
10) Yes ~ both pairs of opposite ∠'s are ≅
11) NO
12) Yes ~ Diagonals bisect each other (CPCTC)