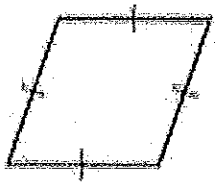
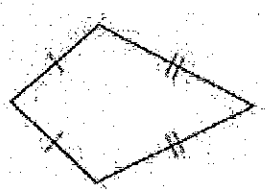
Geometry 21 **Extra Practice 6.4 and 6.6** **Name** _____

Choose the term that most specifically classifies each figure. Choose from the following list of terms;

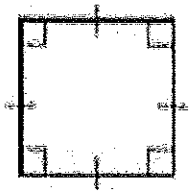
Parallelogram, Rectangle, Rhombus, Square, Trapezoid, Isosceles Trapezoid, Kite

1) 

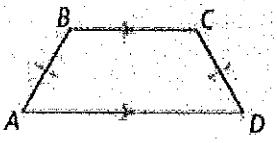
rhombus

2) 

Kite

3) 

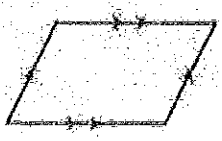
square

4) 

isos. trapezoid

5) 

rectangle

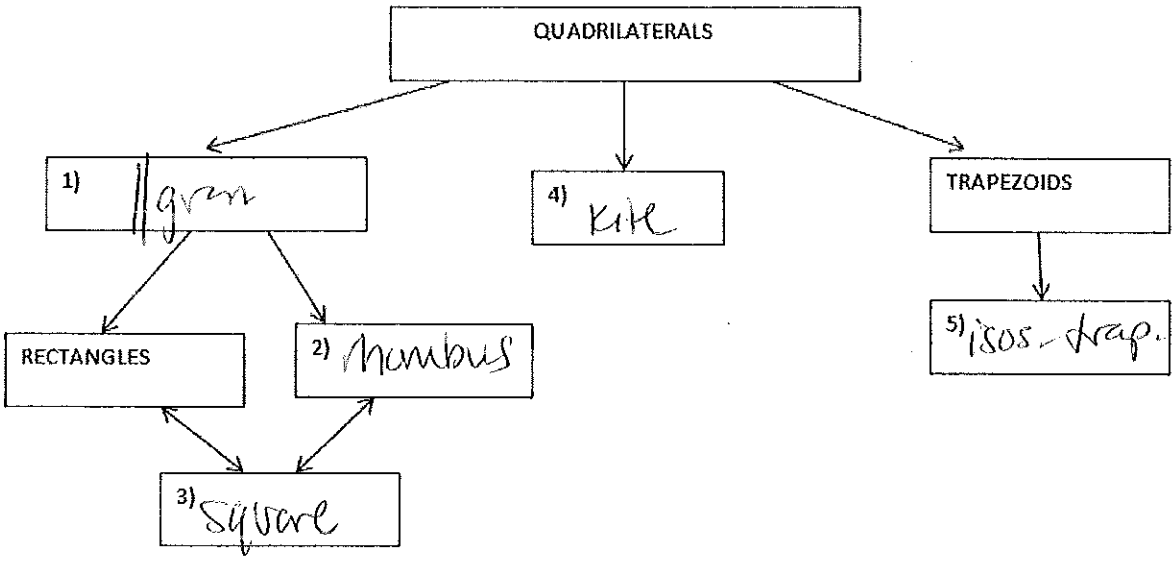
6) 

parallelogram

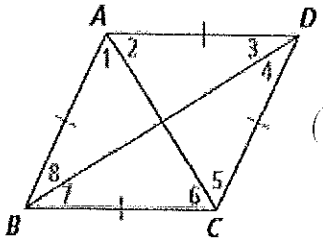
Complete each statement with *always, sometimes,* or *never.*

7. A rhombus is a a parallelogram.
8. A parallelogram is s a rhombus.
9. A rectangle is s a rhombus.
10. A square is a a rhombus.
11. A rhombus is s a square.
12. A rhombus is n a hexagon.

Fill in the 'Quadrilateral Tree' below;



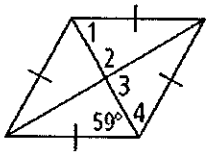
Use the diagram at the right for the following exercises.



20. If $ABCD$ is a rhombus, then $\overline{AC} \perp$ $\overline{BD}$.
21. If $ABCD$ is a rhombus, then $\overline{AC}$ bisects $\angle$ BCD and $\angle$ BAD.
22. If $ABCD$ is a rhombus, then $\angle 1 \cong \angle 2 \cong \angle$ 5 $\cong \angle$ 6.
23. If $ABCD$ is a rhombus, then $\overline{BD}$ bisects $\angle$ ADC and $\angle$ ABC.
24. If $ABCD$ is a rhombus, then $\angle 3 \cong \angle$ 4 $\cong \angle$ 8 $\cong \angle$ 7.

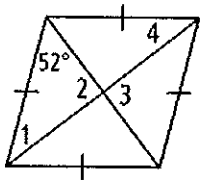
Find the values of the missing angles in each RHOMBUS below;

25.



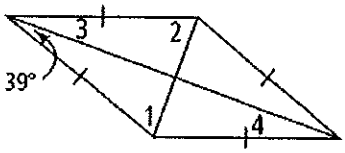
$m\angle 1 = 59$
$m\angle 2 = m\angle 3 = 90°$
$m\angle 4 = 59°$

26.



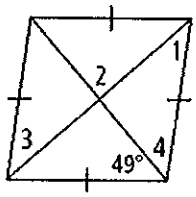
$m\angle 1 = 38$
$m\angle 2 = m\angle 3 = 90$
$m\angle 4 = 38°$

27.



$m\angle 1 = 51° = m\angle 2$
$m\angle 3 = m\angle 4 = 39°$

28.



$m\angle 1 = 41°$
$m\angle 2 = 90°$
$m\angle 3 = 41°$
$m\angle 4 = 49°$

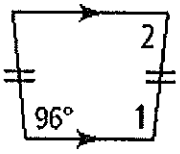
Algebra $HIJK$ is a rectangle. Find the value of x and the length of each diagonal.

29. $HJ = x$ and $IK = 2x - 7$

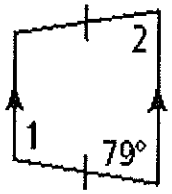
30. $HJ = 3x + 5$ and $IK = 5x - 9$

Find the measures of the numbered angles in each isosceles trapezoid.

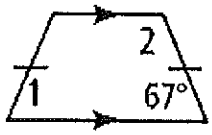
31.



32.

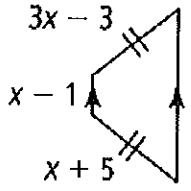


33.

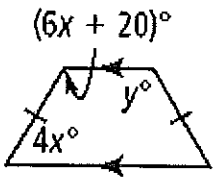


Algebra Find the value(s) of the variable(s) in each isosceles trapezoid.

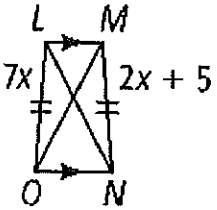
34.



35.

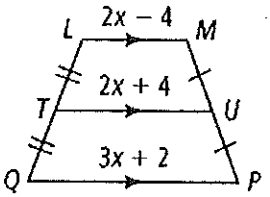


36.

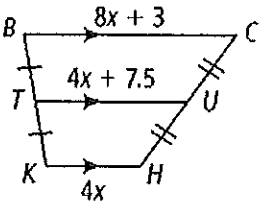


Find the lengths of the segments with variable expressions.

40.

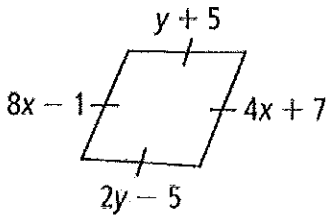


41.

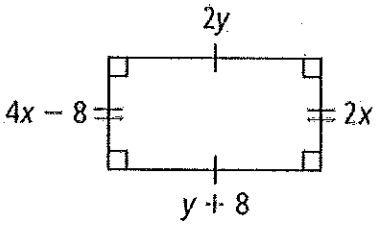


Classify the quadrilateral, then find the values of the variables.

4.

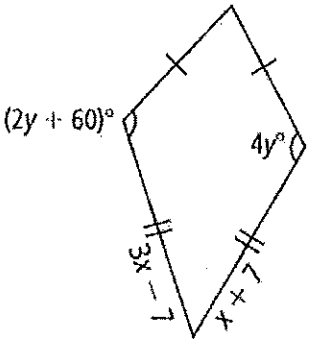


5.



6.

7.

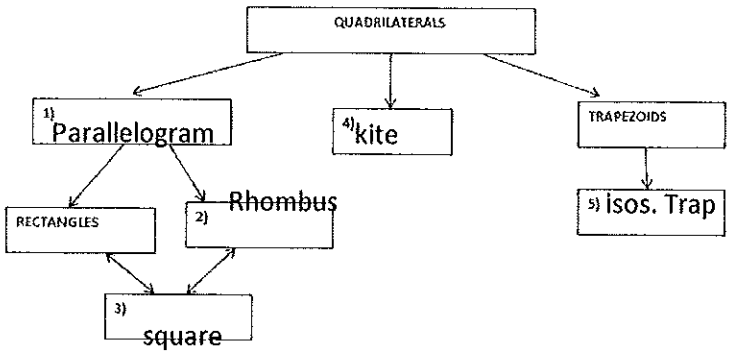


ANSWERS:

1) Rhombus 2) kite 3) square 4) isos. Trapezoid 5) rectangle 6) parallelogram

7) always 8) sometimes 9) sometimes 10) always 11) sometimes 12) never

Fill in the 'Quadrilateral Tree' below:



20) BD 21) <BCD and <BAD

22) <5 and <6 23) <ADC and <ABC

24) <4 , <8, <7

25) 59, 90, 90, 59 26) 38, 90, 90, 38 27) 51, 51, 39, 39 28) 41, 90, 41, 49

29) x = 7, 7, 7 30) x=7, 26, 26 31) 96, 84 32) 101, 79 33) 67, 113

34) x = 4 35) x = 16, y = 116 36) x = 1

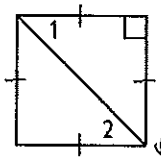
40) x = 10, LM=16, TU=24, QP=32 41) x=3, BC=27, TU=19.5, KH=12

4) rhombus, x=2, y=10 5) rectangle, x = 4, y = 8 6) isos. Trap., x = 3 7) kite, x = 7, y = 30

Lessons 6-4 and 6-5

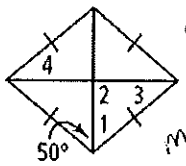
For each parallelogram, determine the most precise name and find the measures of the numbered angles.

1.



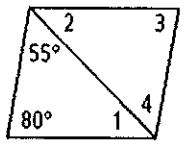
square
$m\angle 1 = m\angle 2 = 45°$

2.



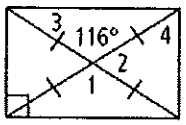
rhombus
$m\angle 1 = 50°$
$m\angle 2 = 90°$
$m\angle 3 = 40°$
$m\angle 4 = 40°$

3.



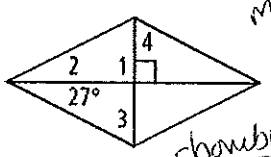
parallelogram
$m\angle 1 = 45°$
$m\angle 2 = 45°$
$m\angle 3 = 80°$
$m\angle 4 = 55°$

4.



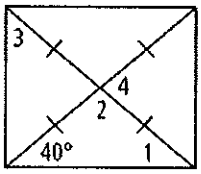
rectangle
$m\angle 1 = 116°$
$m\angle 2 = 64°$
$m\angle 3 = 32°$
$m\angle 4 = 58°$

5.



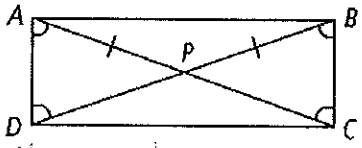
rhombus
$m\angle 1 = 90°$
$m\angle 2 = 27°$
$m\angle 3 = 63°$
$m\angle 4 = 63°$

6.



rectangle
$m\angle 1 = 40°$
$m\angle 2 = 100°$
$m\angle 3 = 50°$
$m\angle 4 = 80°$

7. Use the information in the figure. Explain how you know that *ABCD* is a rectangle.

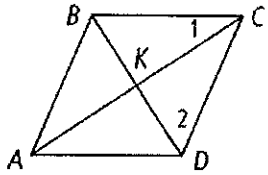


Explain.

∥gram b/c both prs. opp. sides ∥ by Conv. of alt. int. ∠s thm.

↳ diagonals ≅ so RECTANGLE

8. □*ABCD* is a rhombus. What is the relationship between ∠1 and ∠2?



∠1 & ∠2 are complementary b/c diagonals ⊥ so in the △s the 3 ∠s add up to 90, so ∠s are comple.

16. If OT= 2a + b and ER = 80, and GY=3a-b, find a, b, & GY.

$2(80) = 2a+b+3a-b$

$160 = 5a$

$a = 32°$

$2(2a+b) = 80$

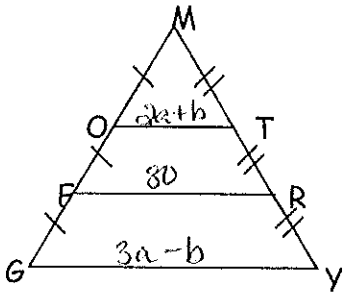
$2($

$2a+b$

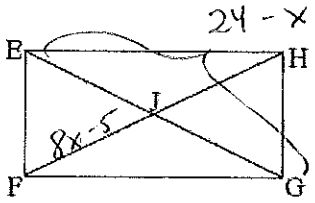
$2(32)+b$

$64+b = 80$

$b = 16$



17. Quadrilateral EFGH is a rectangle. Find the value of x.
JF = 8x – 5, EG = 24 – x



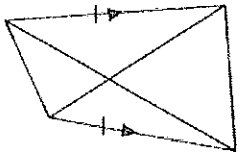
$2(8x-5) = 24-x$

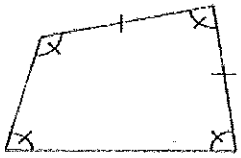
$16x-10 = 24-x$

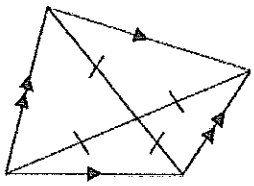
$17x = 34$

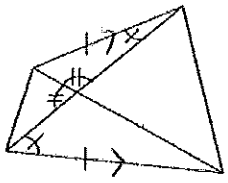
$x = 2$

What is it? Pick the most specific name as possible.

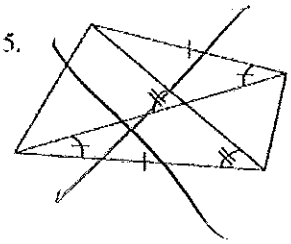
1.  parallelogram

2.  square

3.  rectangle

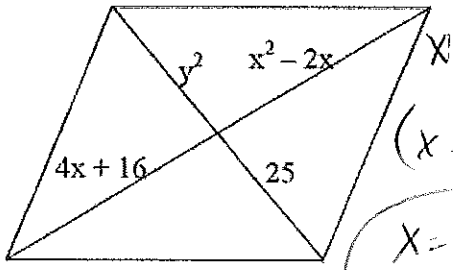
4.  rhombus

Find the values of x and y that ensure the quadrilateral is a parallelogram.

5. 

$y^2 = 25$

$y = 5$



$x^2 - 2x = 4x + 16$

$x^2 - 6x - 16 = 0$

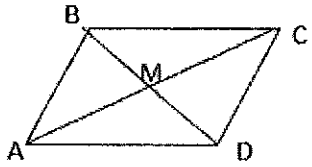
$(x + 2)(x - 8) = 0$

$x = -2$

$x = 8$

1 - 12 Answer with Sometimes, Always or Never.

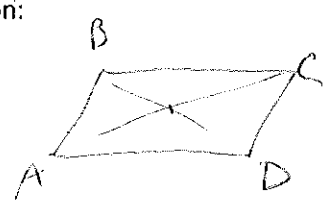
1. A trapezoid is Never a parallelogram.
2. Both pairs of opposite angles of a rhombus are always congruent.
3. Diagonals of a trapezoid are never perpendicular.
4. Consecutive angles of a rhombus are sometimes supplementary and congruent. (square)
5. Consecutive angles of a trapezoid are sometimes congruent. Why? only one pair 
6. $\overline{AB} \cong \overline{BC}$ Sometimes (rhombus) (Use parallelogram ABCD for #6-9.)
7. $\overline{AC} \perp \overline{BD}$ Sometimes (rhombus)
8. $\Delta ABC \cong \Delta CDA$ always (SSS)
9. $\angle BAD$ & $\angle ABC$ are complementary never



10. Find the best name for parallelogram ABCD using the given information:

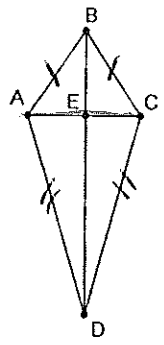
a. M is the midpoint of $\overline{AC}$ & $\overline{DB}$ parallelogram

b. $\overline{AC} \perp \overline{DB}$ rhombus



2. Given: ABCD is a kite with $\overline{AB} \cong \overline{BC}, \overline{AD} \cong \overline{CD}$

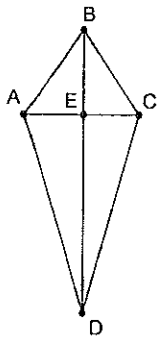
Prove: $\overline{BD}$ bisects $\overline{AC}$



S	R
1) G	1) Given
2) $\overline{BD} \perp \overline{AC}$	2) If kite, then diag. $\perp$
3) $\angle BEC$; $\angle BEA$ are rt. $\angle$s	3) Defn. $\perp$
4) $\triangle BEC$; $\triangle BEA$ are rt. $\triangle$'s	4) Defn. rt. $\triangle$'s
5) $\overline{BE} \cong \overline{BE}$	5) Reflexive
6) $\triangle BEC \cong \triangle BEA$	6) $\cong$ HL
7) $\overline{AE} \cong \overline{CE}$	7) CPCTC
8) $\overline{BD}$ bisects $\overline{AC}$	8) Defn. bisect

3. Given: ABCD is a kite with $\overline{AB} \cong \overline{BC}, \overline{AD} \cong \overline{CD}$

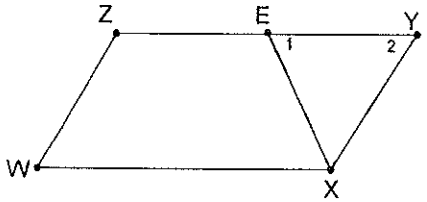
Prove: $\overline{BD}$ bisects $\angle ABC$



S	R
1) G	1) Given
2) $\overline{BD} \perp \overline{AC}$	2) If kite, then diag. $\perp$
3) $\angle DEA$; $\angle DEC$ are rt. $\angle$'s	3) Defn. $\perp$
4) $\triangle DEA$; $\triangle DEC$ are rt. $\triangle$'s	4) Defn rt. $\triangle$
5) $\overline{DE} \cong \overline{DE}$	5) Reflexive
6) $\triangle DEA \cong \triangle DEC$	6) HL
7) $\angle ADE \cong \angle CDE$	7) CPCTC
8) $\overline{BD}$ bis. $\angle ABC$	8) Defn. bisect.

5. Given: WXYZ is a parallelogram, $\angle 1 \cong \angle 2$

Prove: WXEZ is an isosceles trapezoid



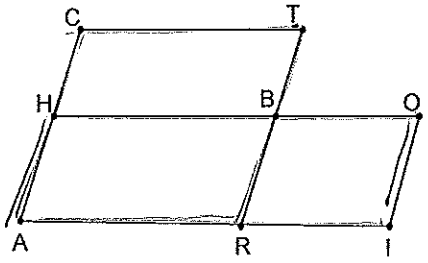
S	R
1) G	1) Given
2) $\overline{EX} \cong \overline{YX}$	2) Conv. Isos. $\triangle$ thm
3) $\overline{YX} \cong \overline{ZW}$	3) Opp. sides $\parallel$gm $\cong$
4) $\overline{EX} \cong \overline{ZW}$	4) Transitive
5) $\overline{ZE} \parallel \overline{WX}$	5) defn. $\parallel$gm
6) WXEZ isos. trap.	6) Defn. isos. trap.

Name ANSWERS Period ____ Date _____

Geometry 21: Quadrilateral Practice Proofs (6.3)

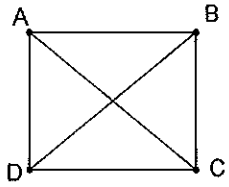
Write a two column proof for each of the following.

1. Given: CART and HAIO are parallelograms
   Prove: $\angle T \cong \angle O$



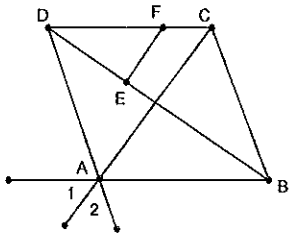
S	R
1) CART ; HAIO are $\parallel$grms	1) Given
2) $\angle T \cong \angle A$; $\angle A \cong \angle O$	2) Opp. $\angle$'s in a $\parallel$grm are $\cong$
3) $\angle T \cong \angle O$	3) Transitive property of $\cong$

4. Given: ABCD is a square
   Prove: $\overline{AC} \cong \overline{BD}$



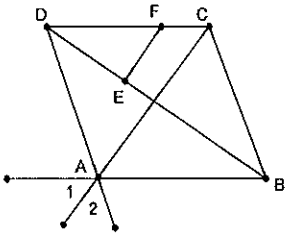
S	R
1) ABCD is a square	1) Given
2) ABCD is a ~~rhombus~~ rectangle	2) Def. square
3) $\overline{AC} \cong \overline{BD}$	3) diag. of rectangle are $\cong$

6. Given: Rhombus ABCD
Prove: $\angle 1 \cong \angle 2$



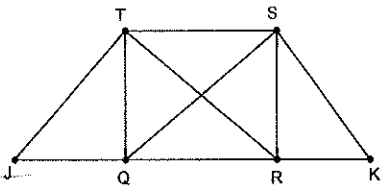
S	R
1) Rhombus ABCD	1) Given
2) $\angle DAC \cong \angle BAC$	2) Diag. of a rhombus bisect opp. $\angle$'s
3) $\angle 1 \cong \angle BAC$	3) Vert. $\angle$'s Thm
4) $\angle BAC \cong \angle DAC$	4) Symmetric
5) $\angle DAC \cong \angle 2$	5) Vert. $\angle$ Thm
6) $\angle 1 \cong \angle 2$	6) Transitive

7. Given: Rhombus ABCD, $\overline{EF} \parallel \overline{AC}$
Prove: $\overline{EF} \perp \overline{DB}$



S	R
1) Rhombus ABCD, $\overline{EF} \parallel \overline{AC}$	1) Given
2) $\overline{AC} \perp \overline{DB}$	2) Diag. of a rhombus $\perp$
3) $\overline{EF} \perp \overline{DB}$	3) If a line is $\perp$ to one of 2 $\parallel$ lines, then it is $\perp$ to the other.

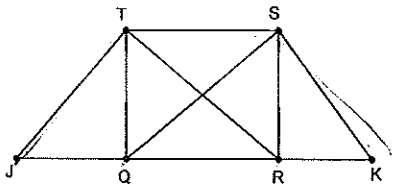
8. Given: Rectangle QRST and parallelogram RKST
Prove: ΔQSK is isosceles



S	R
1) Rectangle QRST, $\parallel$gm RKST	1) Given
2) $\overline{KS} \cong \overline{RT}$	2) opp. sides $\parallel$gm $\cong$
3) $\overline{RT} \cong \overline{QS}$	3) Diag. rectangle $\cong$
4) $\overline{KS} \cong \overline{QS}$	4) Transitive
5) ΔQSK isos.	5) Defn. isos.

9. Given: Rectangle QRST, parallelogram RKST, and parallelogram JQST

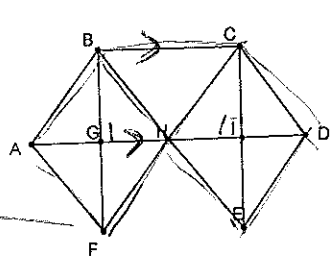
Prove: $\overline{JT} \cong \overline{KS}$



S	R
1) Rect. QRST, $\parallel$gm RKST $\parallel$gm JQST	1) Given
2) $\overline{JT} \cong \overline{QS}$	2) opp. sides $\parallel$gm $\cong$
3) $\overline{QS} \cong \overline{RT}$	3) diag. rect. $\cong$
4) $\overline{RT} \cong \overline{KS}$	4) opp. sides $\parallel$gm $\cong$
5) $\overline{JT} \cong \overline{KS}$	5) Transitive

10. Given: rhombus ABHF and rhombus HCDE; $\overline{BC} \parallel \overline{GI}$

Prove: BCIG is a rectangle



S	R
1) rhombus ABHF ; HCDE $\overline{BC} \parallel \overline{GI}$	1) Given
2) $\overline{BG} \perp \overline{AB}$; $\overline{CI} \perp \overline{AD}$	2) Diag. rhombus $\perp$
3) $\overline{BG} \parallel \overline{GI}$	3) 2 lines $\perp$ to same line are $\parallel$ to each other
4) $\angle BGI$; $\angle CIG$ are rt $\angle$'s	4) Defn $\perp$
5) BCIG is a parallelogram	5) Defn $\parallel$gm
6) $\angle CBG = \angle GIG$ $\angle ICB \cong \angle BGI$	6) opp. $\angle$'s of $\parallel$gm $\cong$
7) m$\angle$	