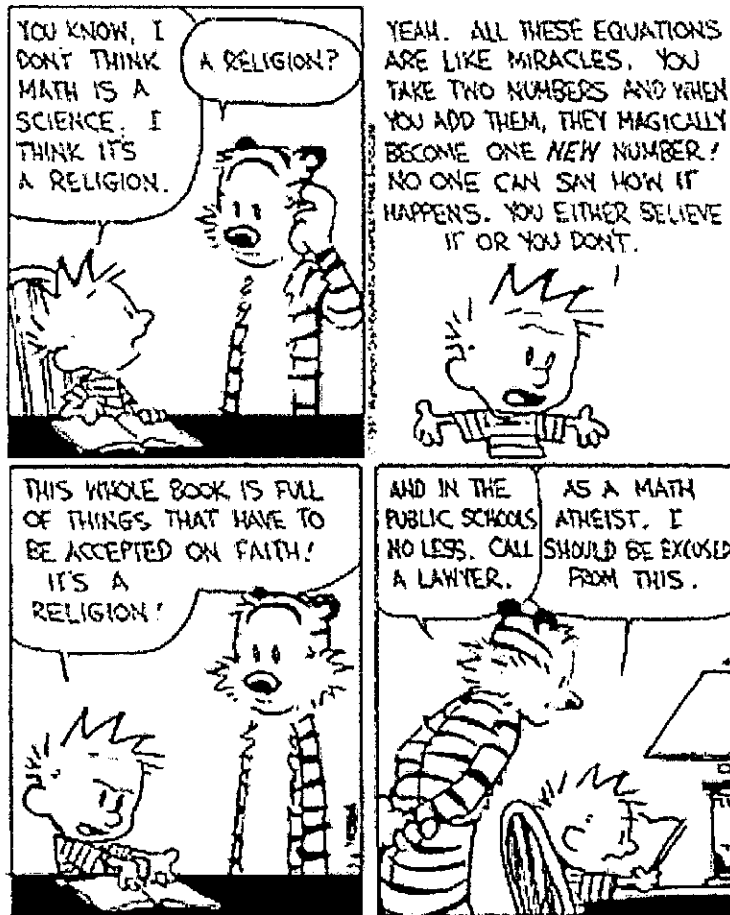


Unit E: Polygons

Geometry 1st Semester



Lesson 6-3: Types of Quadrilaterals

Vocabulary

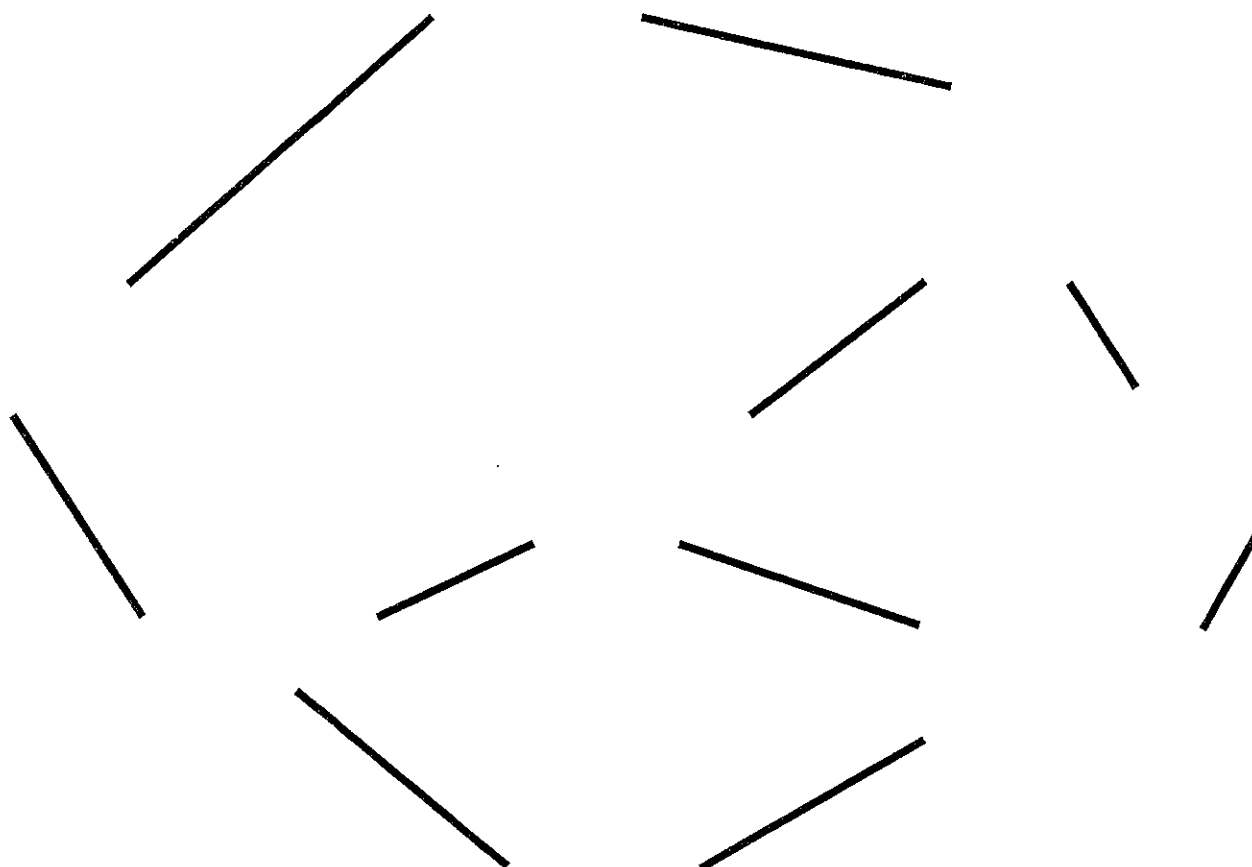
Name & Description	Picture
Square	
Rectangle	
Parallelogram	
Rhombus	
Trapezoid	
Isosceles Trapezoid	
Kite	

Bases: _____

Base Angles: _____

Example

QUADRILATERAL HIERARCHY



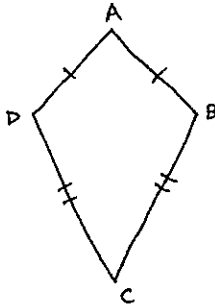
Lesson 6-4: Properties of Kites

(Notice: all 7 types of quadrilaterals are either kites, trapezoids, or both!)

Vocabulary

Ends: _____

Example

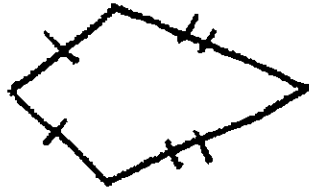


Kite Symmetry Theorem: _____

Symmetry Diagonal: _____

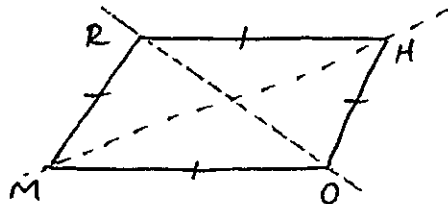
Kite Diagonal Theorem: _____

Example



Rhombus Diagonal Theorem: _____

Example



Practice

1. What other quadrilaterals are considered kites? These figures will also have the same qualities about them that a kite does. (Hint: think about the hierarchy!)

2. Given KITE below with ends K and T , $EL = 10$, $m\angle EKT = 43$ and $m\angle ITK = 24$.

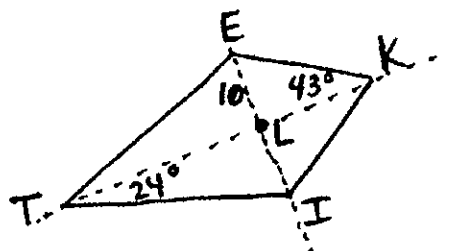
a. $m\angle IKT =$ _____

b. $m\angle ETK =$ _____

c. $LI =$ _____

d. $m\angle TIK =$ _____

e. $m\angle KLE =$ _____



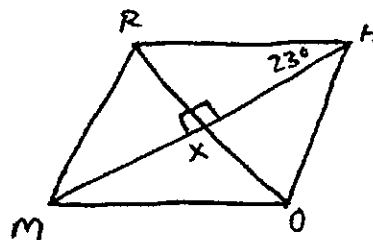
3. Given RHOM at the right.

a. $m\angle MHO =$ _____

b. $m\angle RMH =$ _____

c. $m\angle OMH =$ _____

d. $m\angle XRH =$ _____



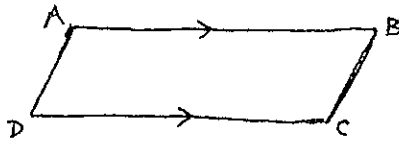
Lesson 6-5: Properties of Trapezoids

(Notice: all 7 types of quadrilaterals are either kites, trapezoids, or both!)

Vocabulary

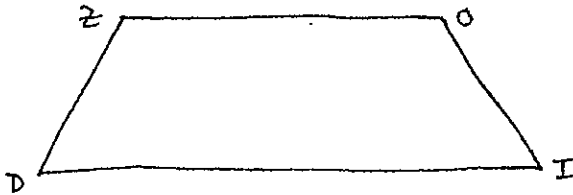
Trapezoid Angle Theorem: _____

Example



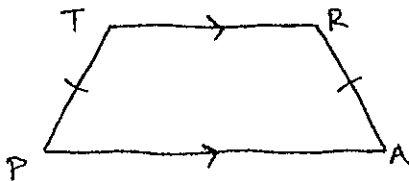
Isosceles Trapezoid Symmetry Theorem: _____

Example



Isosceles Trapezoid Theorem: _____

Example



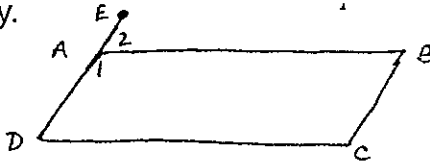
Rectangle Symmetry Theorem: _____

Example



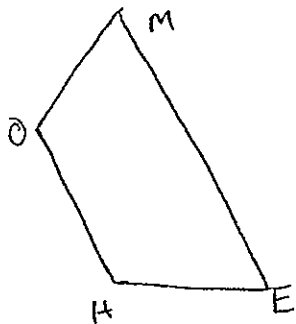
Practice

- What other quadrilaterals are considered trapezoids? These figures will also have the same qualities about them that a trapezoid does. (Hint: think about the hierarchy!)
- Given: $ABCD$ is a trapezoid with $AB \parallel CD$ and AD has been extended to point E . Prove: $\angle 1$ and $\angle D$ are supplementary.

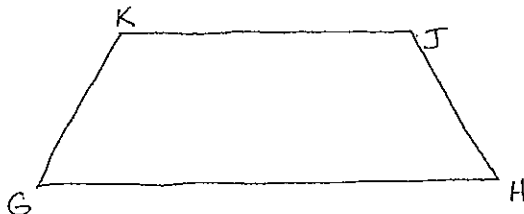


Conclusions	Justifications
0.	
1. $m\angle 1 + m\angle 2 = 180$	
2.	Corresponding Angles
3. $m\angle 1 + m\angle D = 180$	
4.	Definition of supplementary angles

- In trapezoid HOME, $HO \parallel ME$. If $m\angle O = 118$, find the measures of as many other angles as you can.



- GHJK is an isosceles trapezoid with bases GH and JK, where $HJ = 31.8$ and $m\angle H = 19$. Find as many other lengths and angle measures as possible.



Lesson 7-7 & 7-8: Properties of Parallelograms

(Notice: there are 3 other quadrilaterals under a parallelogram in the hierarchy!)

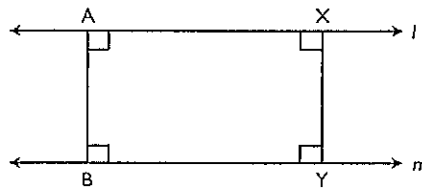
Vocabulary

Properties of a Parallelogram Theorem: In any parallelogram,

- a) _____
- b) _____
- c) _____

Parallel Lines Distance Theorem: _____

Example



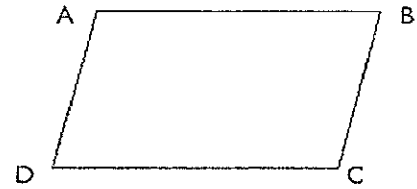
Parallelogram Symmetry Theorem: _____

Sufficient Conditions for a Parallelogram Theorem: If, in a quadrilateral,

a)		
b)		
c)		
d)		

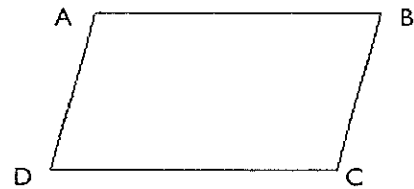
then the quadrilateral is a parallelogram.

Practice



1. Given: ABCD is a parallelogram.
 Prove: In any parallelogram, opposite angles are congruent.

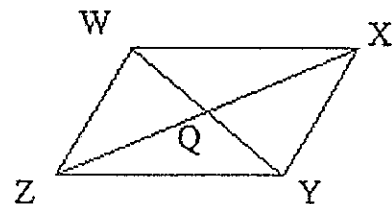
Conclusions	Justifications
0.	
1. $AD \cong BC, AB \cong DC$	
2. $BD \cong BD$	
3. $\triangle ABD \cong \triangle CDB$	
4. $\angle DAB \cong \angle BCD$	



2. Given: ABCD is a parallelogram.
 Prove: In any parallelogram, the diagonals intersect at their midpoints.

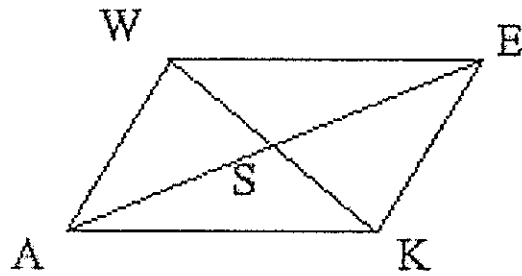
Conclusions	Justifications
0.	
1. $\angle ADB \cong \angle CBD$	
2. $\angle AED \cong \angle CEB$	
3. $AD \cong BC$	
4. $\triangle ADE \cong \triangle CBE$	
5. $AE \cong CE, DE \cong BE$	
6. E is the midpoint of AC and BD	

3. In parallelogram WXYZ, $WQ = 4$, $XQ = 6$, and $YZ = 7$.
- Find QY.
 - Find WX.
 - Name both pairs of parallel sides.



4. Refer to the quadrilateral below. If $m\angle KEA = 40$ and $m\angle EAK = 35$, find the following angles.

- a. $\angle EAW$
- b. $\angle AEW$
- c. $\angle EWA$
- d. $\angle EKA$



5. Given the following information, is ABCD a parallelogram?

- a. $m\angle BAD = 60$, $m\angle ADC = 60$

- b. $AB = 11$, $BC = 15$, $CD = 11$, $AD = 15$

- c. $AB \parallel CD$, $AD = 8$, $BC = 8$

Lesson 5-7: Sums of Angle Measures in Polygons

Vocabulary

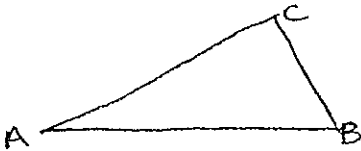
Triangle Sum Theorem: _____

Quadrilateral Sum Theorem: _____

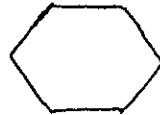
Polygon Sum Theorem: _____

Practice

1. In $\triangle ABC$, the angles are in the ratio 1:2:3. Find $m\angle A$, $m\angle B$, and $m\angle C$.



2. How many degrees are in a 5 and 6 sided figure?



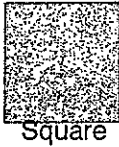
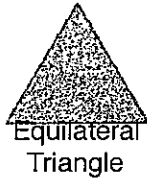
3. If the measure of the angles of a quadrilateral are in the ratio 2:3:4:6, what are the measures of the angles?
4. Give the sum of the measures of the angles of a convex octagon.

Lesson 6-7: Regular Polygons

Vocabulary

Regular Polygon: _____

Example



Equilateral: _____

Equiangular: _____

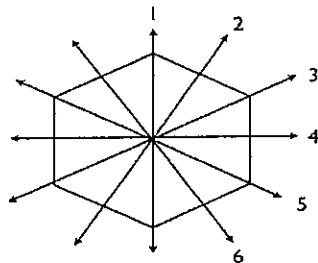
Regular Polygon Symmetry Theorem: every regular n -gon possesses,

1) (if n is even): _____

(if n is odd): _____

2) _____

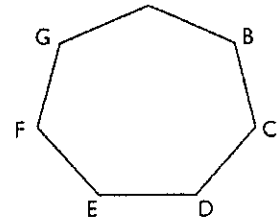
Example



Practice

1. a. Find the number of n -fold rotations of a regular heptagon ABCDEFG.

b. Draw all lines of symmetry on heptagon ABCDEFG.



2. Find the measure of an interior angle of a:

a) regular octagon

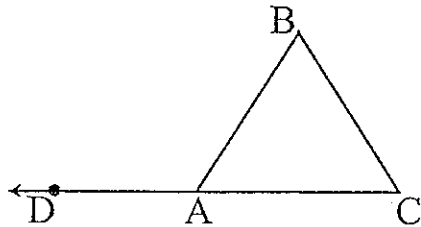
b) regular decagon

Lesson 7-9: Exterior Angles

Vocabulary

Exterior Angle: _____

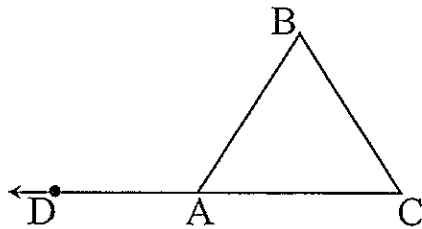
Example



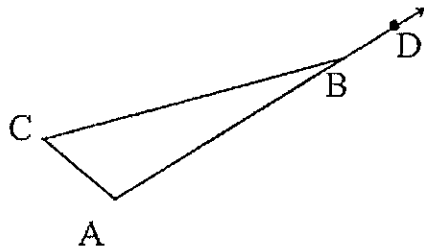
Exterior Angle Theorem: _____

Practice

1. Give the measures of $\angle BAD$ if $\angle B = 49$ and $\angle C = 53$.



2. Find y if $\angle BAC = 21y - 33$, $\angle ACB = 9y + 9$ and $\angle CBD = 27y - 3$.



3. Find $m\angle 3$ and $m\angle 4$.

