Name: Key	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Polygon

A **polygon** is a closed ~~plane~~ figure formed by three or more line segments, called sides.

Classifying Polygons

Polygons can be classified by the **number of sides** they have. Complete the table below.

# of Sides	Polygon Name	# of Sides	Polygon Name
3	Triangle	7	Heptagon
4	Quadrilateral	8	Octagon
5	Pentagon	9	Nonagon
6	Hexagon	10	Decagon

Sum of the Interior Angle Measures

The sum of the degrees of the interior angles in any polygon can be determined by the number of triangles that can be drawn within the polygon. Complete the chart below and look for a pattern.

Polygon	Number of Sides	Number of Triangles	Sum of Interior Angle Measures
Triangle 	3	1	180°
Quadrilateral 	4	2	360
Pentagon 	5	3	540
Hexagon 	6	4	720

Formula

If n represents the number of sides of a polygon, then the sum of the interior angles, S, can be found using the formula:

$$S_n = (n-2) \cdot 180$$

Examples

Find the sum of the measures of the interior angles of each polygon.

1. heptagon

$S_7 = (7-2) \cdot 180 = 900°$

2. decagon

$S_{10} = (10-2) \cdot 180 = 1440°$

3. 13-gon

$S_{13} = (13-2) \cdot 180 = 1980°$

4. 25-gon

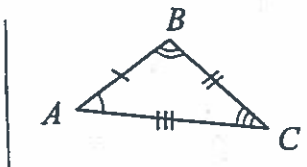
$S_{25} = (25-2) \cdot 180 = 4140°$

Congruent Polygons

- **Congruent polygons** have the same size and shape.
- All **corresponding parts** (sides and angles) are congruent.

Congruency Statements

When polygons are congruent, we can write a **congruency statement**.



$\triangle ABC \cong \triangle DEF$

A **valid congruency statement** must match all corresponding angles and sides.

Examples

Directions: Identify the congruent parts given the congruency statement.

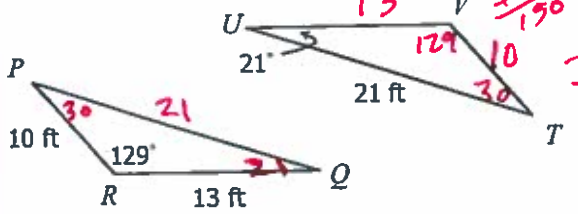
5. $\triangle WXY \cong \triangle QRS$

$\angle W \cong \angle Q$	$\overline{WX} \cong \overline{QR}$	$\angle Y \cong \angle S$	$\overline{WY} \cong \overline{QS}$
$\angle X \cong \angle R$	$\overline{XY} \cong \overline{RS}$		

6. rhombus $EFGH \cong$ rhombus $JKLM$

$\angle E \cong \angle J$	$\overline{EF} \cong \overline{JK}$	$\angle H \cong \angle M$	$\overline{GH} \cong \overline{LM}$
$\angle L \cong \angle L$	$\overline{JM} \cong \overline{EF}$		

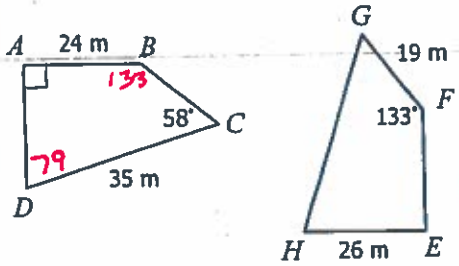
7. $\triangle PQR \cong \triangle TUV$



129 + 21 = 150; 180 − 150 = 30

$m\angle V =$ 129°
$m\angle Q =$ 21°
$m\angle P =$ 30
$PQ =$ 21
$UV =$ 13

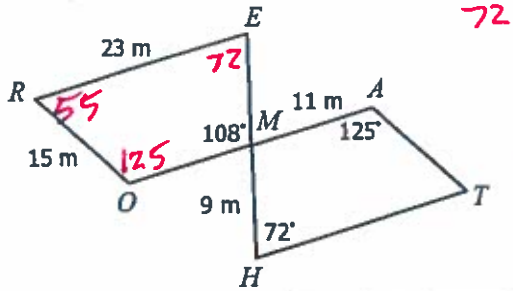
8. quadrilateral $ABCD \cong$ quadrilateral $EFGH$



90 + 133 + 58 = 281; 360 − 281 = 79

$m\angle G =$ 58°
$m\angle B =$ 133°
$m\angle H =$ 79°
$AD =$ 26
$FE =$ 24

9. trapezoid $MORE \cong$ trapezoid $MATH$



72 + 125 + 108 = 305; 360 − 305 = 55

$m\angle E =$ 72°
$m\angle T =$ 55°
$m\angle O =$ 125°
$HM = EM =$ 9
$RE = HT =$ 23