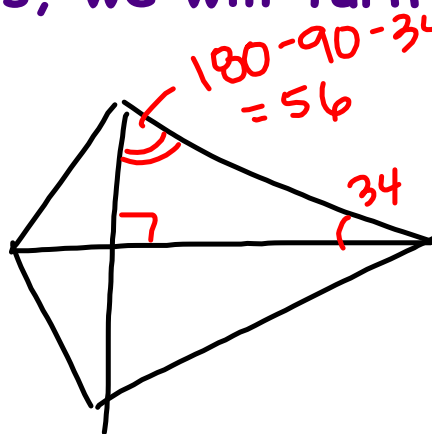


**A3: NO QUIZ TODAY!!**

**We will go over any questions from lesson  
7.2 and 7.3 and move on to lesson 7.4, so  
get ready!!**

**A5: NO QUIZ TODAY!!**

Work on the bright green worksheet  
(lesson 7.3 Assignment) as soon as the bell  
rings, we will turn it in shortly!



$$\begin{array}{r} 7.1 \\ \hline \#2) \overline{PQ} \parallel \overline{RS} \\ \overline{QR} \parallel \overline{PS} \end{array}$$

$$\#4) \angle PQR, \angle QRS, \angle RSP, \angle SPQ$$

$$\begin{array}{r} 7.2 \\ \hline \#1) 124^\circ \end{array}$$

$$\#9) 90^\circ$$

$$\#4) 12$$

# Interior Angles of a Polygon

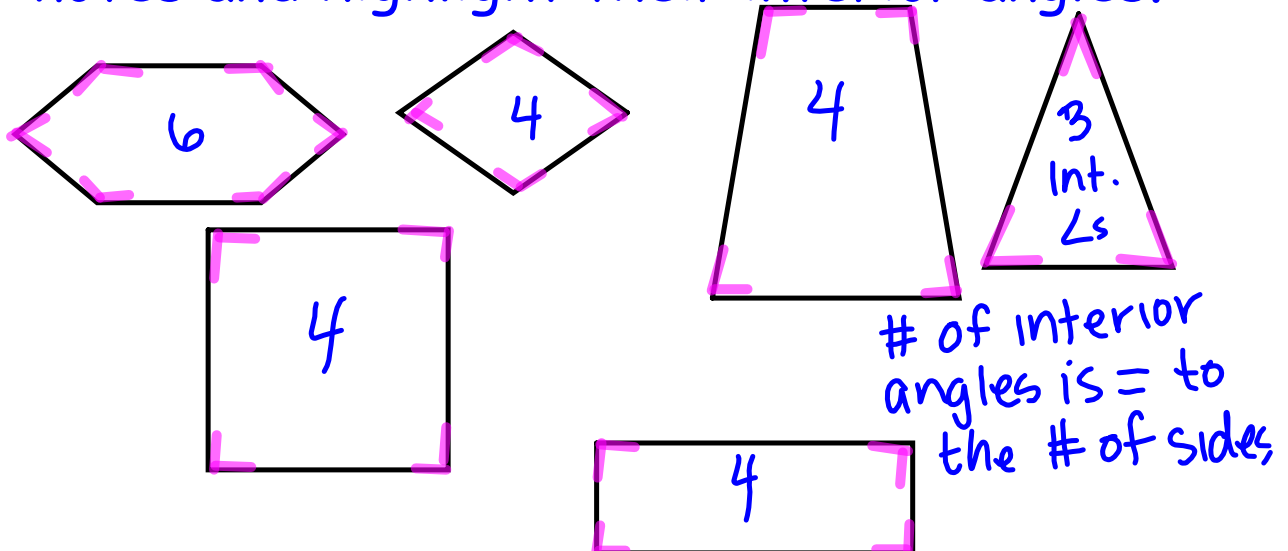
**7.4**

## Sum of the Interior Angle Measures of a Polygon

PG.527-28 IN YOUR BOOK

An interior angle of a polygon faces the inside of a polygon and is formed by consecutive sides of the polygon.

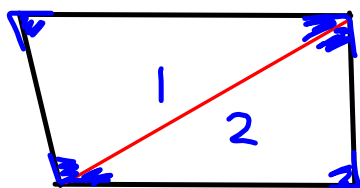
Draw two of the following polygons in your notes and highlight their interior angles.



## PG.529 IN YOUR BOOK

The Triangle Sum Theorem states that the sum of the three interior angles of any triangle is equal to  $180^\circ$ . You can use this information to calculate the sum of the interior angles of other polygons.

1. Calculate the sum of the interior angle measures of a quadrilateral by completing each step.
  - a. Draw a quadrilateral. Draw a diagonal using only one vertex of the quadrilateral.



- b. How many triangles are formed when the diagonal divides the quadrilateral?

2

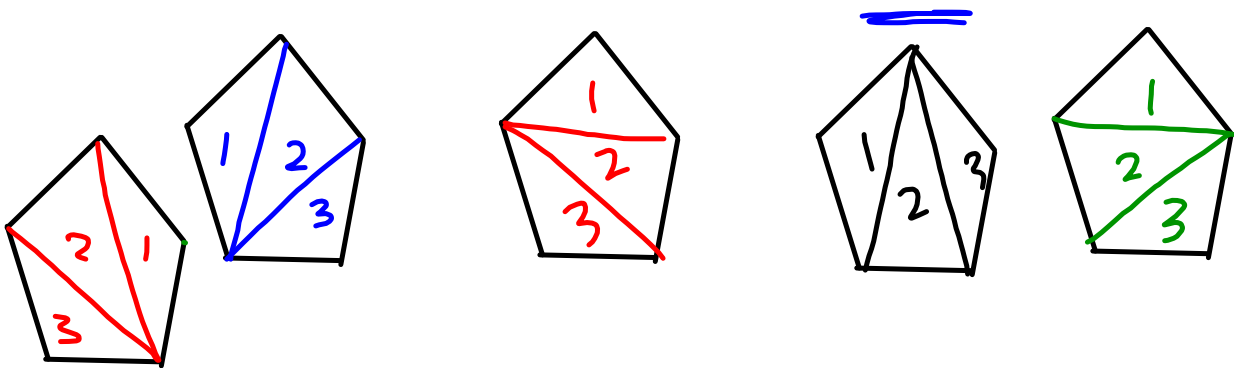
- c. If the sum of the interior angle measures of each triangle is  $180^\circ$ , what is the sum of all the interior angle measures of the triangles formed by the diagonal?

$$2(180) = 360^\circ$$

## PG.530 IN YOUR BOOK

Calculate the sum of the interior angle measures of a pentagon by completing each step.

- a. Draw a pentagon. Draw all possible diagonals using only one vertex of the pentagon.



- b. How many triangles are formed when the diagonal(s) divide the pentagon?

3

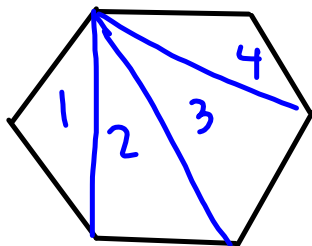
- c. If the sum of the interior angle measures of each triangle is  $180^\circ$ , what is the sum of all the interior angle measures of the triangles formed by the diagonal(s)?

$$3(180) = 540^\circ$$

## PG.530 IN YOUR BOOK

3. Calculate the sum of the interior angle measures of a hexagon by completing each step.

a. Draw a hexagon. Draw all possible diagonals using one vertex of the hexagon.

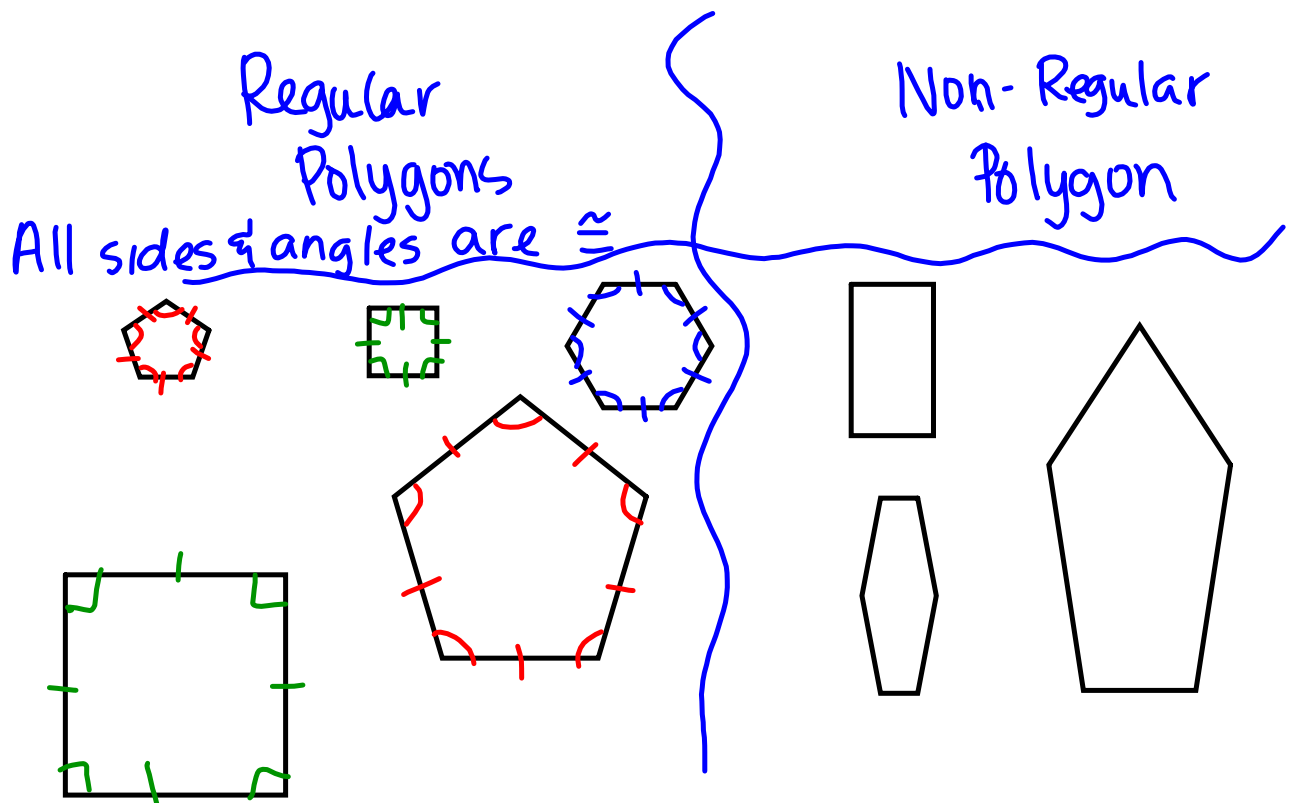


b. How many triangles are formed when the diagonal(s) divide the hexagon?

4

c. If the sum of the interior angle measures of each triangle is  $180^\circ$ , what is the sum of all the interior angle measures of the triangles formed by the diagonal(s)?

$$4(180) = \underline{720^\circ}$$



## PG.531 IN YOUR BOOK

4. Complete the table shown.

Number of Sides of the Polygon	3	4	5	6	7
Number of Diagonals Drawn	0	1	2	3	4
Number of Triangles Formed	1	2	3	4	5
Sum of the Measures of the Interior Angles	$180^\circ$	$360^\circ$	$540^\circ$	$720^\circ$	$900^\circ$

5. What pattern do you notice between the number of possible diagonals drawn from one vertex of the polygon, and the number of triangles formed by those diagonals?

# of triangles is one more than # of diagonals

6. Compare the number of sides of the polygon to the number of possible diagonals drawn from one vertex. What do you notice?

# of diagonals is 3 less than # of sides

7. Compare the number of sides of the polygon to the number of triangles formed by drawing all possible diagonals from one vertex. What do you notice?

# of triangles is 2 less than # of sides

8. What pattern do you notice about the sum of the interior angle measures of a polygon as the number of sides of each polygon increases by 1?

sum increases by  $180^\circ$

9. Predict the number of possible diagonals drawn from one vertex and the number of triangles formed for a seven-sided polygon using the table you completed.

10. Predict the sum of all the interior angle measures of a seven-sided polygon using the table you completed.

see table above



## PG.532 IN YOUR BOOK

11. Continue the pattern to complete the table.

Number of Sides of the Polygon	7	8	9	16
Number of Diagonals Drawn	4	5	6	13
Number of Triangles Formed	5	6	7	14
Sum of the Measures of the Interior Angles	900°	1080°	1260°	2520°

Sum of Interior Angles in a Polygon:  
 $180(n-2)$

where  $n$  is the # of sides.

Finish pgs. 532-<sup>533</sup>~~538~~ in your book

11-gon  
 13-gon  
 ⋮  
 n-gon

PG. 533 #4

each interior  
 angle in a

regular  
 polygon

$$\frac{180(n-2)}{n}$$

#6 on pg 533

$$n \cdot 150 = \frac{180(n-2)}{n}$$

$$150n = 180(n-2)$$

$$150n = 180n - 360$$

$$-150n \quad -150n$$

$$0 = 30n - 360$$

$$+360 \quad +360$$

$$\frac{360}{30} = \frac{30n}{30}$$

$$\underline{12 = n}$$

## NOT IN YOUR BOOK

Determine the measure of an interior angle of the given regular polygon.

1. regular nonagon

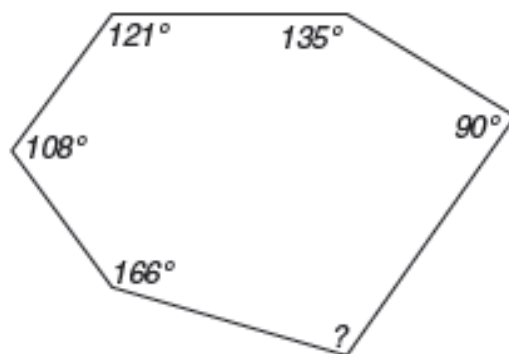
2. regular decagon

3. regular 15-gon

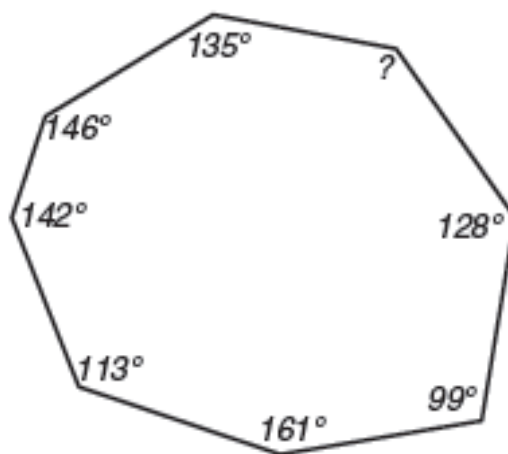
4. regular 47-gon

Determine the measure of the missing angle in each figure.

5.

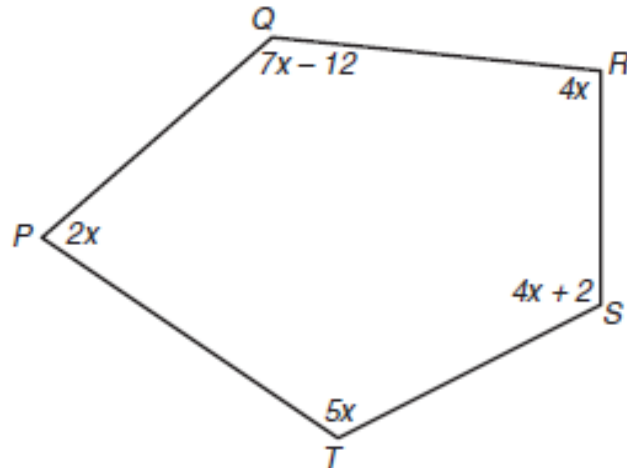


6.



## NOT IN YOUR BOOK

7. Use the figure to answer each question.



- What is the sum of the measures of the interior angles of the polygon?
  - What is the value of  $x$ ?
  - What is the measure of  $\angle PTS$ ?
  - What is the measure of angle  $\angle RQP$ ?
8. Suppose that the sum of the measures of the interior angles of a regular polygon is  $157.5^\circ$ . What type of polygon is it? Show your work and explain how you got your answer.
9. Suppose that the degree measure of each angle of a regular 12-gon can be represented by the expression  $2x + 5$ . Calculate the value of  $x$ .

# Homework

## Finish Lesson 7.4