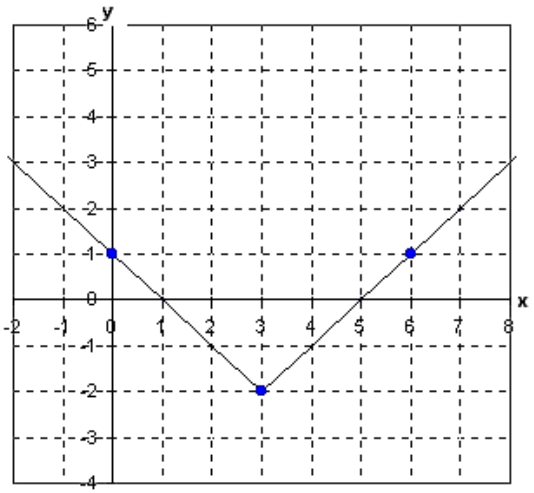
BRING YOUR TEXTBOOK VOLUME 2!!!

Created by Mr. Lischwe

Warmup 2/(# of vowels + consonants in the alphabet)



Which equation represents the graphed function?

a. $f(x) = |x + 3| - 2$
b. $f(x) = |x - 3| - 2$
c. $f(x) = |x - 3| + 2$
d. $f(x) = |x + 3| + 2$

The first four terms of a sequence are shown.

$$2, \frac{1}{2}, \frac{1}{8}, \frac{1}{32}, \ldots$$

a. What is the next term in the sequence?
b. What is the recursive formula for the sequence?

a. $a_1 = 2;\ a_n = 2a_{n-1}$
b. $a_1 = 2;\ a_n = a_{n-1} - 2$
c. $a_1 = 2;\ a_n = \frac{1}{4}a_{n-1}$
d. $a_1 = 2;\ a_n = 2a_{n-1} - 4$

Simplify using exponent rules.

$$\frac{25x^3y^4z^{-2}z^3}{50x^{-2}y^6}$$

NEW UNIT: Geometric Proof

- We will branch out to other types of proofs besides just congruent triangles

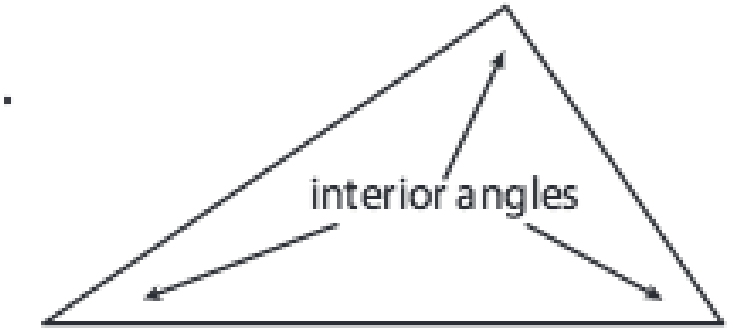
- We will not JUST do proofs – we'll learn things about polygons, triangles, and quadrilaterals

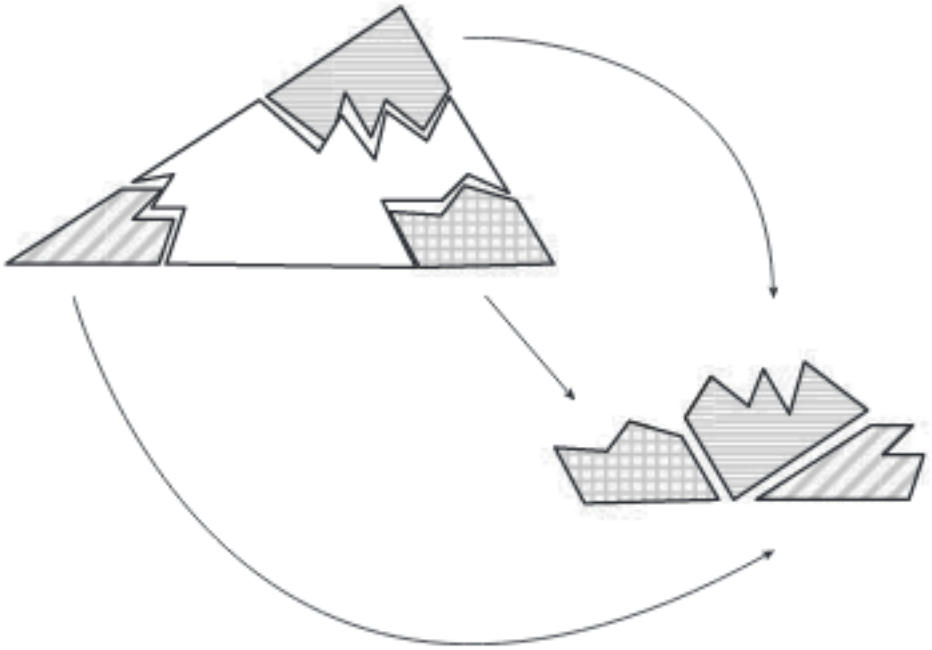
OBJECTIVE: EXPLORE INTERIOR ANGLES OF POLYGONS

Interior Angles

- An interior angle is an angle formed by two sides of a polygon with a common vertex.

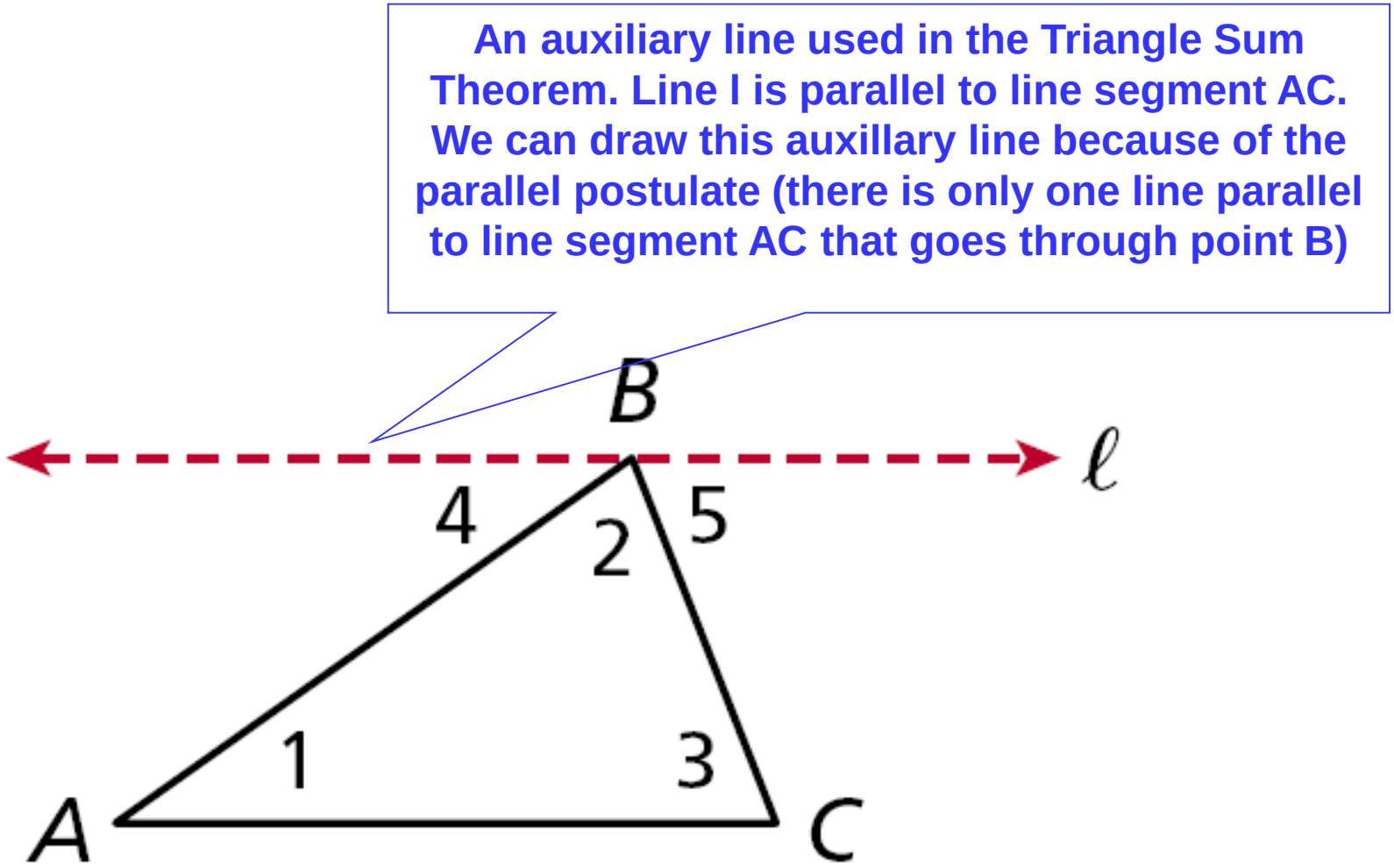
- A triangle has three interior angles

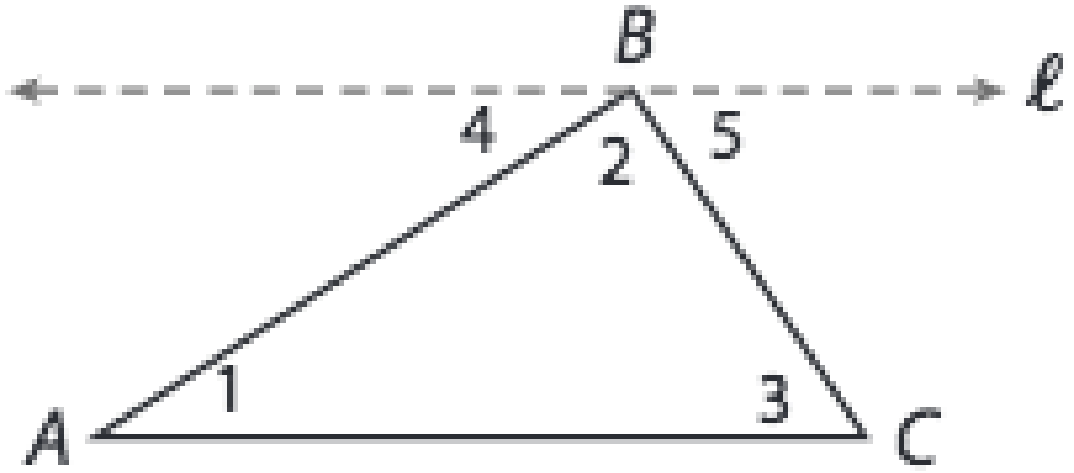




- What do you notice?
- The sum of the interior angles of a triangle add to _____

An **auxiliary line** is a line that is added to a figure to aid in a proof.





Statements	Reasons
1. Draw line ℓ through point B parallel to $\overline{AC}$.	**1.** Parallel Postulate
2. $m\angle 1 = m\angle$ _____ and $m\angle 3 = m\angle$ _____	**2.**
3. $m\angle 4 + m\angle 2 + m\angle 5 = 180°$	**3.** Angle Addition Postulate and definition of straight angle
4. $m\angle$ _____ $+ m\angle 2 + m\angle$ _____ $= 180°$	**4.**

Explore Angles in a Quadrilateral

- **USE A RULER to draw a quadrilateral**
- Cut your quadrilateral out.
- Tear off the four corners of the quadrilateral.
- Rearrange the angles so their sides are adjacent and their vertices meet at a point.

- What do you notice?
- The sum of the interior angles of a quadrilateral add to **360º**

Polygon- a closed figure having three or more sides and lying on one plane

Number of Sides	Name of Polygon
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
12	Dodecagon
n	*n*-gon

11 sides= hendecagon

Fun Facts!

11 hendecagon

12 dodecagon

13 triskaidecagon or tridecagon

14 tetrakaidecagon or tetradecagon

15 pendedecagon

16 hexdecagon

17 heptdecagon

18 octdecagon

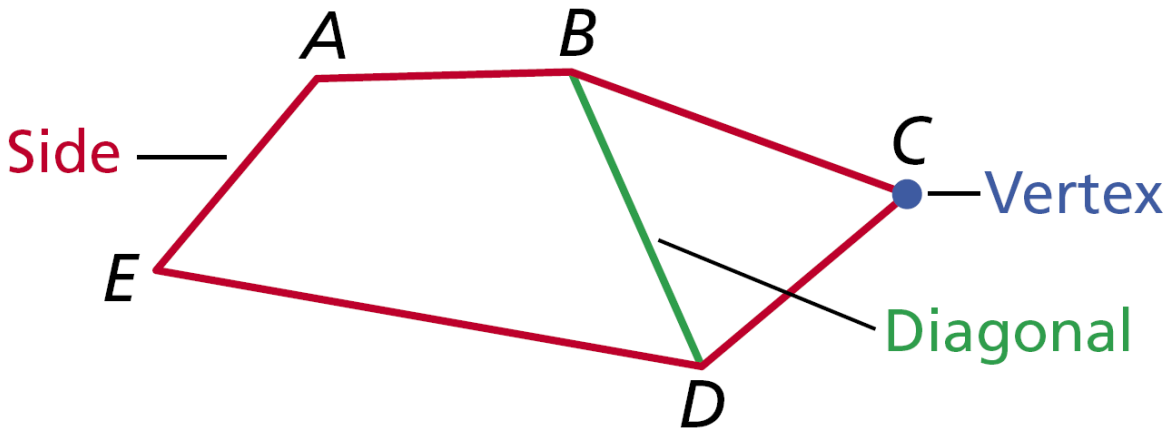
19 enneadecagon

20 icosagon

but you can just say 13-gon

“Parts” of a polygon

Each segment that forms a polygon is a **side of the polygon**. The common endpoint of two sides is a **vertex of the polygon**. A segment that connects any two nonconsecutive vertices is a **diagonal**.

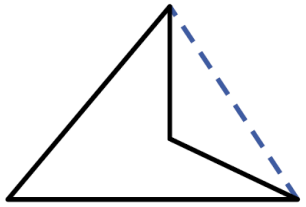


Concave vs. Convex

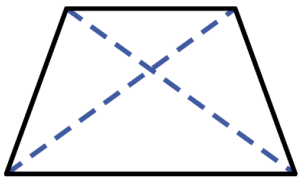
A polygon is **concave** if any part of a diagonal contains points in the exterior of the polygon. If no diagonal contains points in the exterior, then the polygon is **convex**.

OR we can say a polygon is concave if it has one or more interior angles greater than 180°, convex if it does not

http://www.mathopenref.com/polygonconcave.html



Concave quadrilateral



Convex quadrilateral

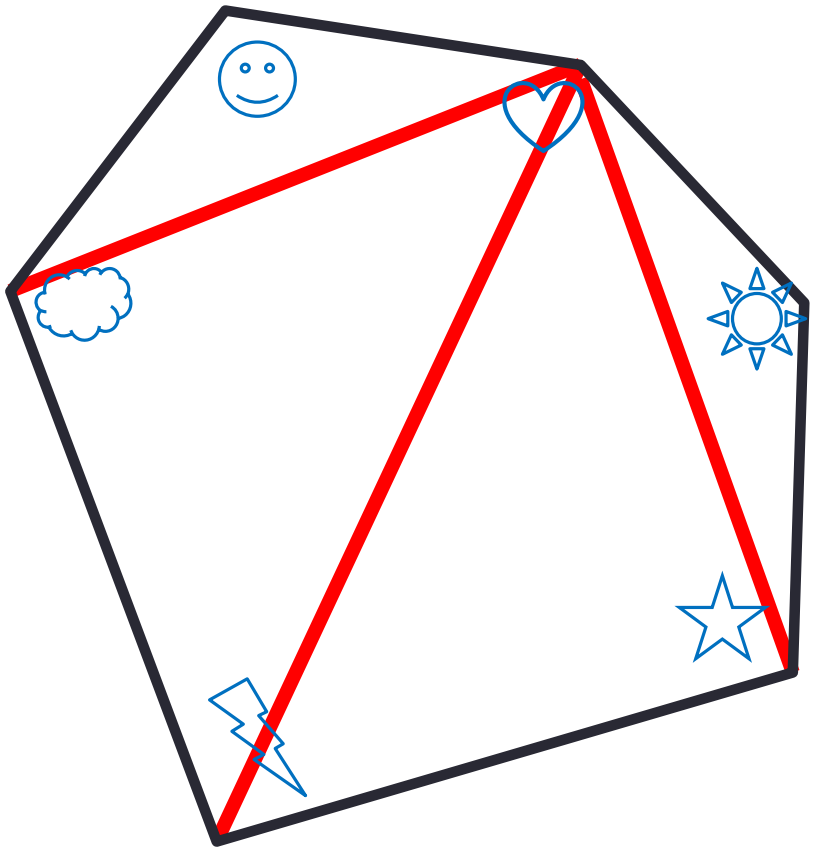
Equilateral: all sides congruent
Equiangular: all angles congruent
Regular all sides AND angles congruent

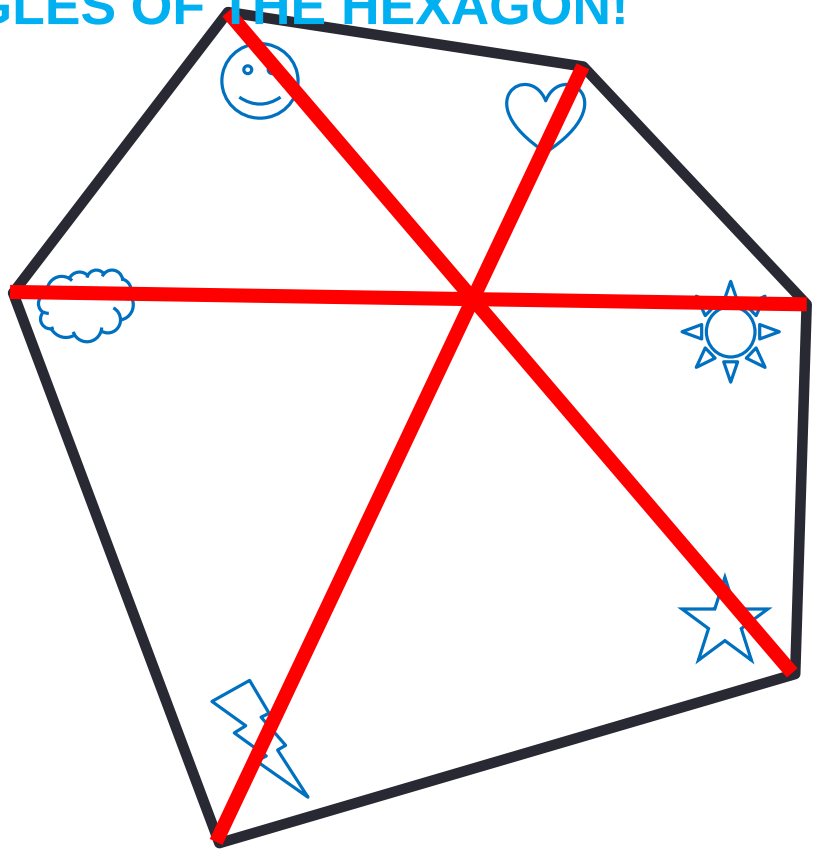
(Irregular – not regular)

FROM NOW ON WE WILL ONLY BE TALKING ABOUT CONVEX POLYGONS!

Finding the angle sum of a polygon…

USE THE METHOD TO THE LEFT – THE ONE ON THE RIGHT INCLUDES ANGLES THAT ARE IN THE "MIDDLE" THAT ARE NOT PART OF THE INTERIOR ANGLES OF THE HEXAGON!





Pick **ONE** vertex and draw all possible diagonals from it. How many triagnles are formed?

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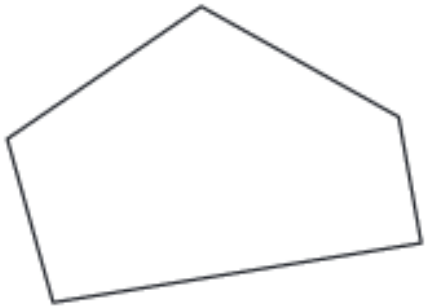
triangle

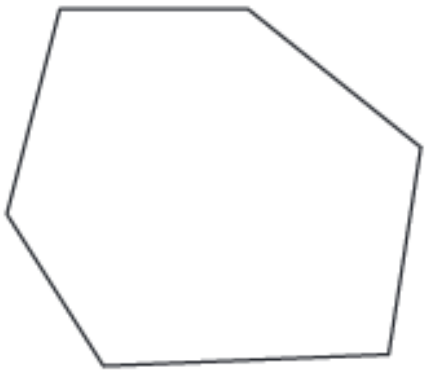
1 triangle

quadrilateral

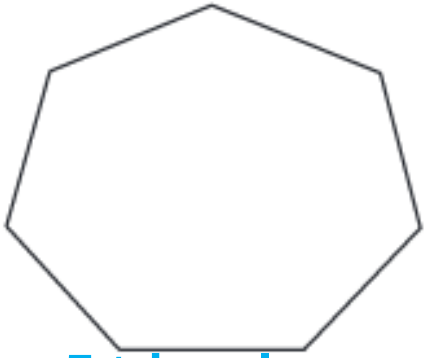
2 triangles



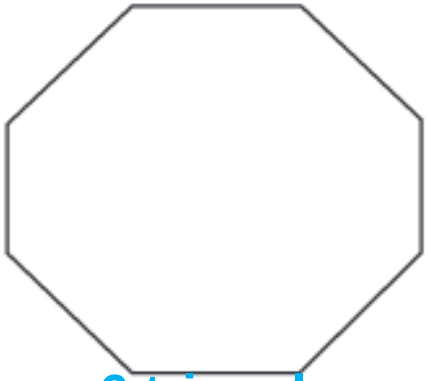
3 triangles



4 triangles



5 triangles



6 triangles

Fill in the Chart!

Polygon	Number of Sides	Number of Triangles	Sum of Interior Angle Measures
Triangle	3	1	$(1)180° = 180°$
Quadrilateral	4	2	$(2)180° = 360°$
Pentagon			$(\_\_\_\_)\,180° =$ 540°
Hexagon			$(\_\_\_\_)\,180° =$ 720°
Decagon			$(\_\_\_\_)\,180° =$ 1440°

HIGHLIGHT/ASTERISK/UNDERLINE/ETC.

Polygon Angle Sum Theorem

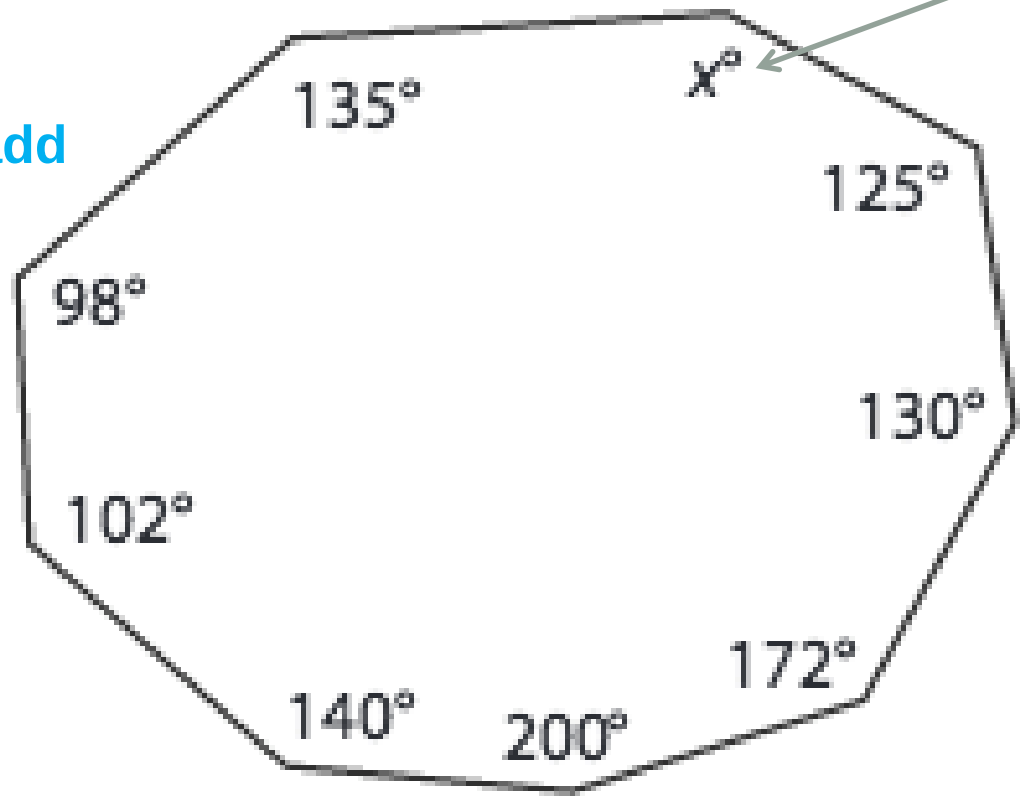
The sum of the measures of the interior angles of a convex polygon with **n** sides is **$(n - 2)180^{o}$**

Find the sum of the angles then Find x

9 sides, sum should be 7(180) = 1260°

All other angles add up to 1102°

x = 158



Work with your group (you can use your own paper or the margins in the book)

1. **Find the sum of the interior angle measures of a convex heptagon.**

   $5(180) = 900^o$

2. **If a polygon has an interior angle sum of 1800^o, what type of polygon is it?**

   1800/180 = 10, so 10 triangles

   10 + 2 = 12 sides

3. **Find the measure of <u>each interior angle</u> of a regular 16-gon.**

   $14(180) = 2520^o$

   $2520/16 = 157.5^o$

Homework

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