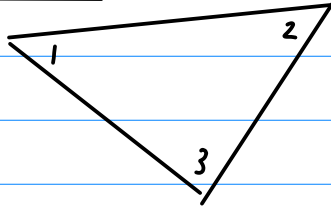


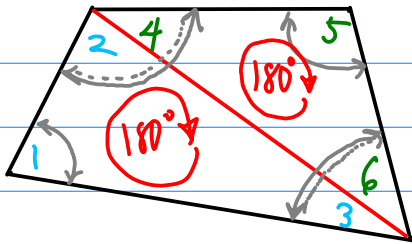
§5.1: Polygon Sum Conjecture

n (# sides)
3



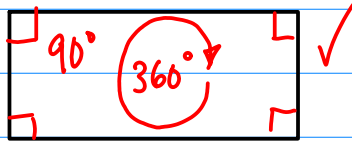
Sum of measures of interior \angle 's
 $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$

4

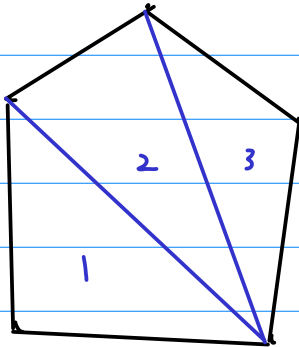


$m\angle 1 + m\angle 2 + m\angle 4 + m\angle 5 + m\angle 6 + m\angle 3$
 $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 + m\angle 6$
 $180^\circ + 180^\circ$

$\rightarrow 2 \Delta's \times 180^\circ \rightarrow 360^\circ$



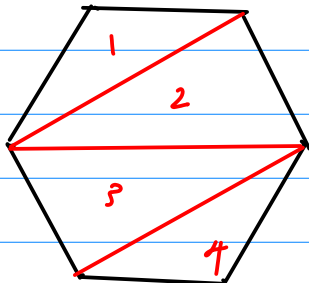
5



$3 \Delta's \times 180^\circ \rightarrow 540^\circ$

$\frac{180^\circ \times 3}{540^\circ}$

6



$4 \Delta's \times 180^\circ \rightarrow 720^\circ$

$\frac{3 \times 180^\circ \times 4}{720^\circ}$

<u>n</u>	<u>#Δ's</u>	<u>Sum of int. \angle's</u>
3	1	180°
4	2	360°
5	3	540°
6	4	720°
⋮	⋮	⋮
10	8	1440°

$$\begin{array}{r} 180^\circ \\ \times 8 \\ \hline 1440^\circ \end{array}$$

$$\text{Sum of int } \angle \text{'s} = (\underbrace{\# \Delta \text{'s}}_{n-2}) \cdot 180^\circ$$

* $\text{Sum of int } \angle \text{'s} = (n-2) \cdot 180^\circ$ Polygon Sum Conjecture

Ex:

What is the sum of the measures of the \angle 's of a 27-gon?

(n=27)

$$\text{Sum of int } \angle \text{'s} = (n-2) \cdot 180^\circ$$

$$= (27-2) \cdot 180^\circ$$

$$= (25) \cdot 180^\circ$$

$$= \boxed{4,500^\circ}$$

$$\begin{array}{r} 180^\circ \\ \times 25 \\ \hline 900 \\ + 3600 \\ \hline 4500 \end{array}$$

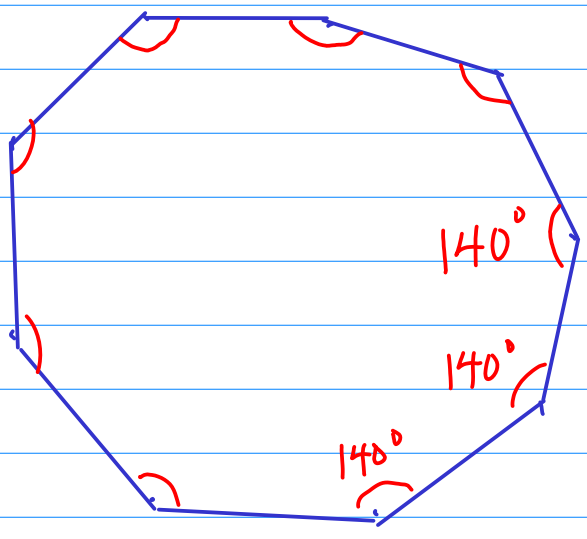
Ex:

\cong sides & \angle 's

$n=9$

A regular nonagon has an \angle sum of (a). Each \angle measures (b).

$$\begin{array}{r} 180^\circ \\ \times 7 \\ \hline 1260 \end{array}$$

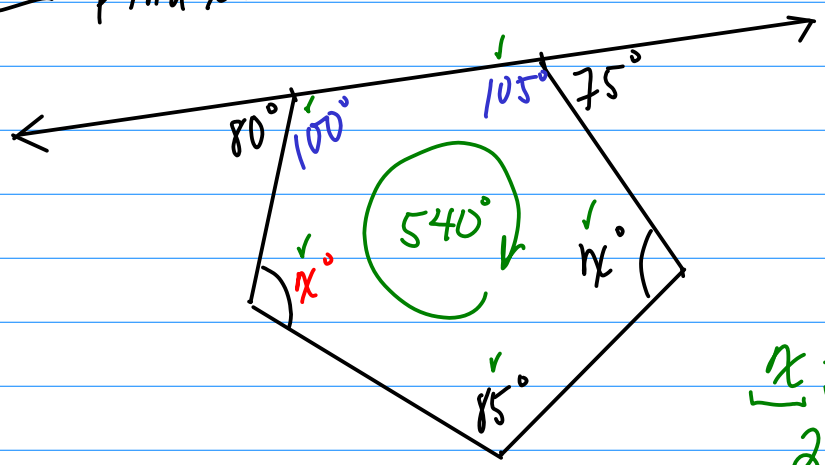


(a) $\text{sum of int. } \angle \text{'s} = (n - 2) \cdot 180^\circ$
 $= (9 - 2) \cdot 180^\circ$
 $= 7 \cdot 180^\circ$
 $= 1,260^\circ$

(b) $\boxed{140^\circ}$ $\leftarrow \div 9$

$$9 \overline{) 1260} \begin{array}{l} 140 \\ \underline{9} \\ 1260 \\ \underline{9} \\ 0 \end{array}$$

Ex: Find x :



$n=5 \rightarrow \text{Sum of int. } \angle \text{'s} = 540^\circ$

$$x + x + 85 + 100 + 105 = 540^\circ$$

$$2x + 290 = 540$$

$$\begin{array}{r} 2x + 290 = 540 \\ - 290 \quad - 290 \\ \hline 2x = 250 \\ \hline x = 125 \end{array}$$

$\boxed{x = 125^\circ}$

Ex:

If the \angle 's of a polygon sum to 1620° , how many sides does it have?

$$\text{Sum of int } \angle\text{'s} = (n-2) \cdot 180^\circ$$

$$\frac{81 \cancel{1620}^\circ}{9 \cancel{180}^\circ} = \frac{(n-2) \cdot \cancel{180}^\circ}{\cancel{180}^\circ}$$

$$\begin{array}{r} 9 = n - 2 \\ +2 \qquad +2 \end{array}$$

$$\boxed{11 = n}$$