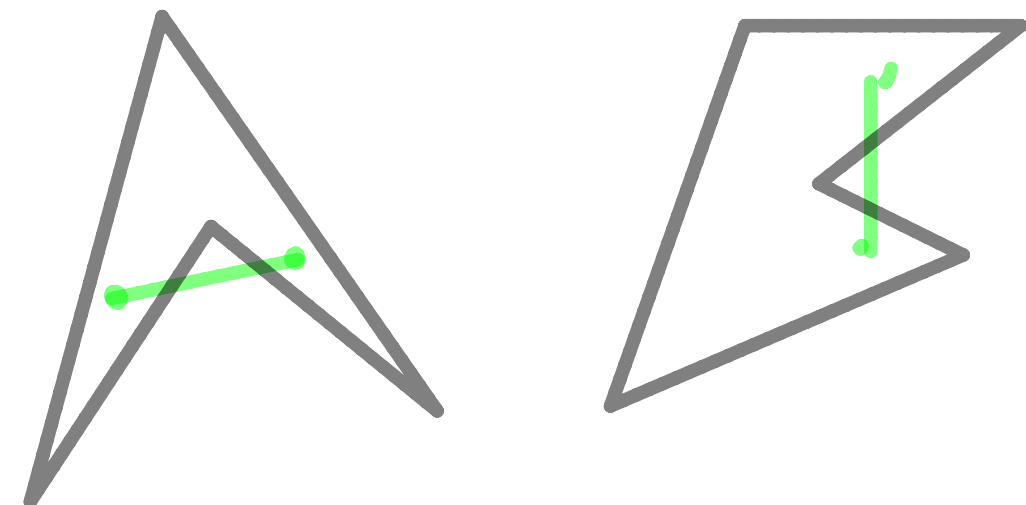


POLÍGONOS

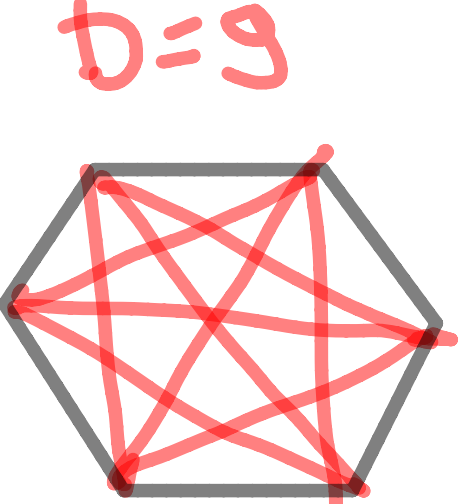
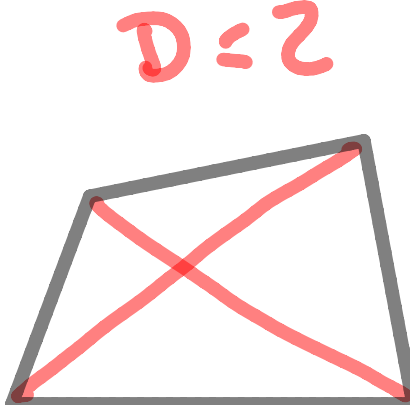
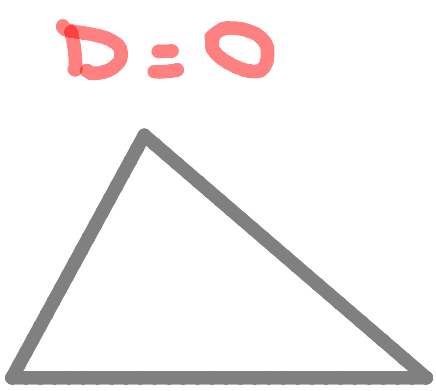
1 Tipos

1.1 Côncavo



importantes!!!
↓

1.2 Convexo

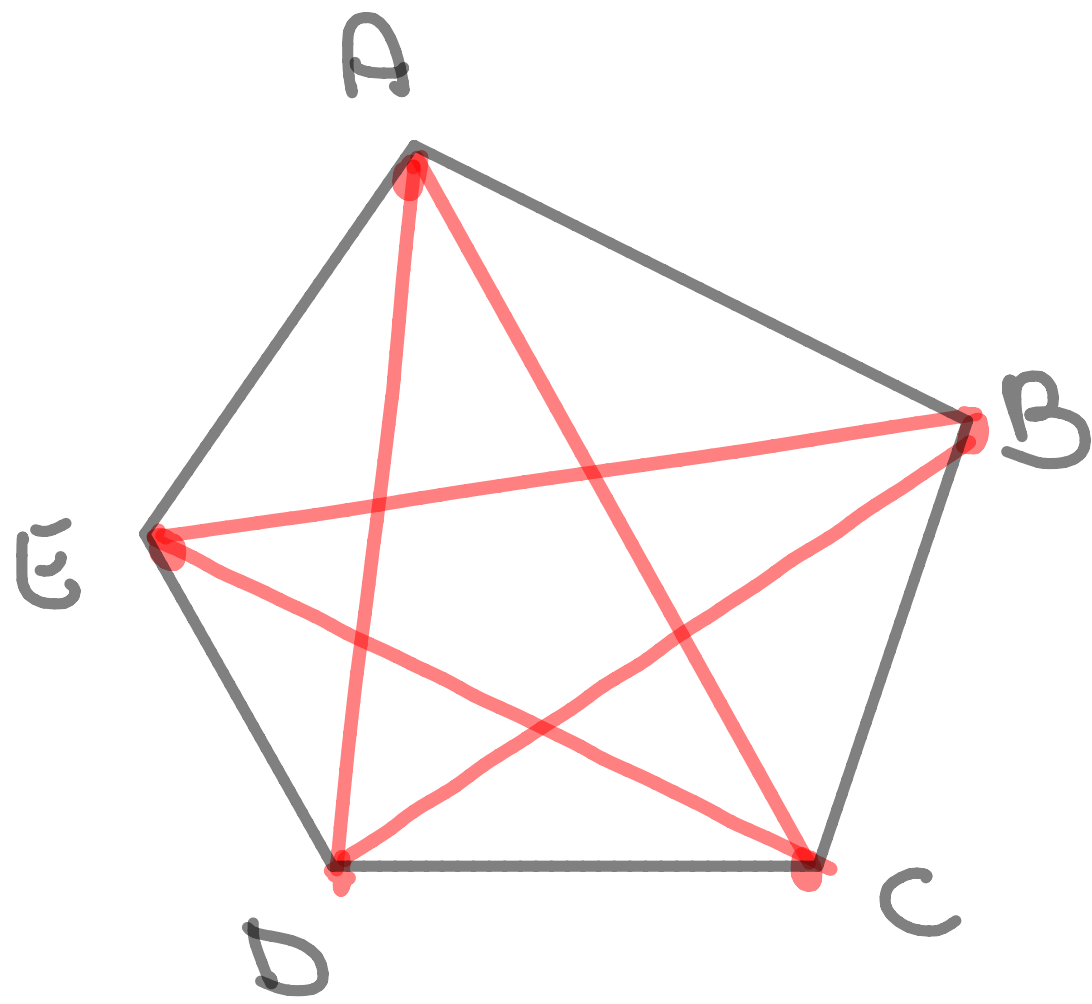


2 Nomenclatura

(*)

n	NOME
3	TRIÂNGULO
4	QUADRILÁTERO
5	PENTÁGONO
6	HEXÁGONO
7	HEPTÁGONO
8	OCTÓGONO
9	ENECÁGONO
10	DECÁGONO
11	UNDECÁGONO
12	DODECÁGONO
⋮	
15	PENTADECÁGONO
⋮	
20	ICOSÁGONO

3 Elementos



• Vértices: A, B, C, D e E

• Lados: \overline{AB} , \overline{BC} , \overline{CD} ,
(arestas) \overline{DE} e \overline{EA}

• Diagonais: \overline{AC} , \overline{AD} , \overline{BD} ,
 \overline{BE} e \overline{CE}



$$D = \frac{n(n-3)}{2}$$

(nº de diagonais)

(PUC)
Exemplo 1) Determine o nº de diagonais de um Icoságono.

$$n = 20$$

$$D = ?$$

$$D = \frac{n(n-3)}{2}$$

$$D = \frac{20(20-3)}{2} = 170 \text{ diag.}$$

Exemplo 2

Determine o polígono cujo nº de diagonais é igual ao dobro do nº de lados.

$$n(n-7) = 0$$

~~$n = 0$~~

$n - 7 = 0$
 $n = 7$
(Heptágono), //

$$n = 7 \Rightarrow D = 7 \cdot \frac{7-3}{2} = 14 //$$

$$D = \frac{n(n-3)}{2}$$

$$D = 2n$$

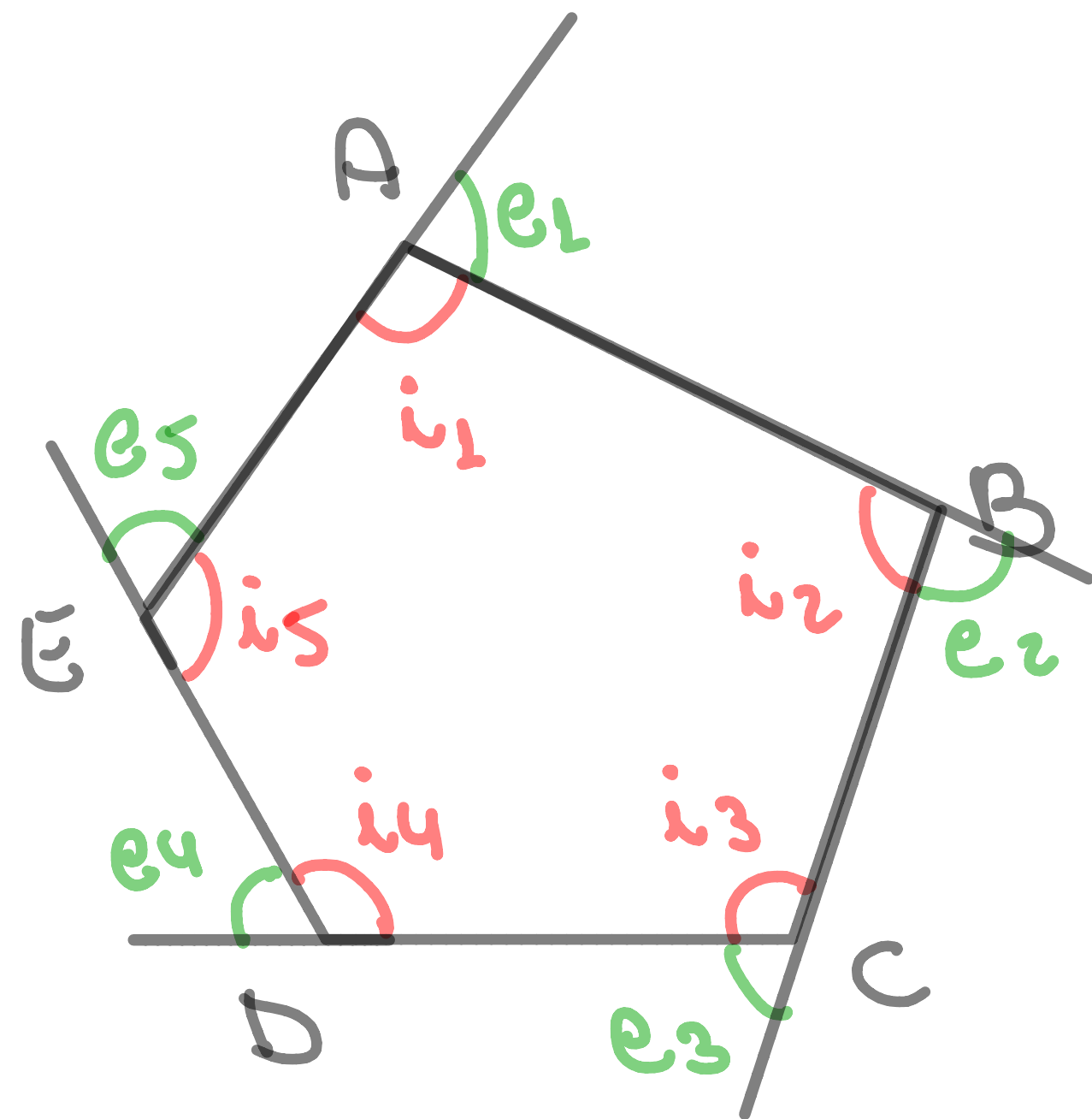
$$2n = \frac{n(n-3)}{2}$$

$$n(n-3) = 4n$$

$$n^2 - 3n = 4n$$

$$n^2 - 7n = 0$$

4 Ângulos



* Soma dos ângulos internos (S_i)

$$S_i = i_1 + i_2 + i_3 + i_4 + \dots + i_n$$

$$S_i = (n-2) \cdot 180^\circ$$

n° de Δ s!

* Soma dos ângulos externos (S_e)

$$S_e = e_1 + e_2 + e_3 + e_4 + \dots + e_n$$

$$S_e = 360^\circ$$

Exemplo 3) Determine o nº de diagonais de um polígono cuja soma dos ângulos internos é igual a 1800° .

$D = ?$

$$D = \frac{n(n-3)}{2}$$

$$D = \frac{6 \cdot 9}{2}$$

$D = 54$ diag. // //

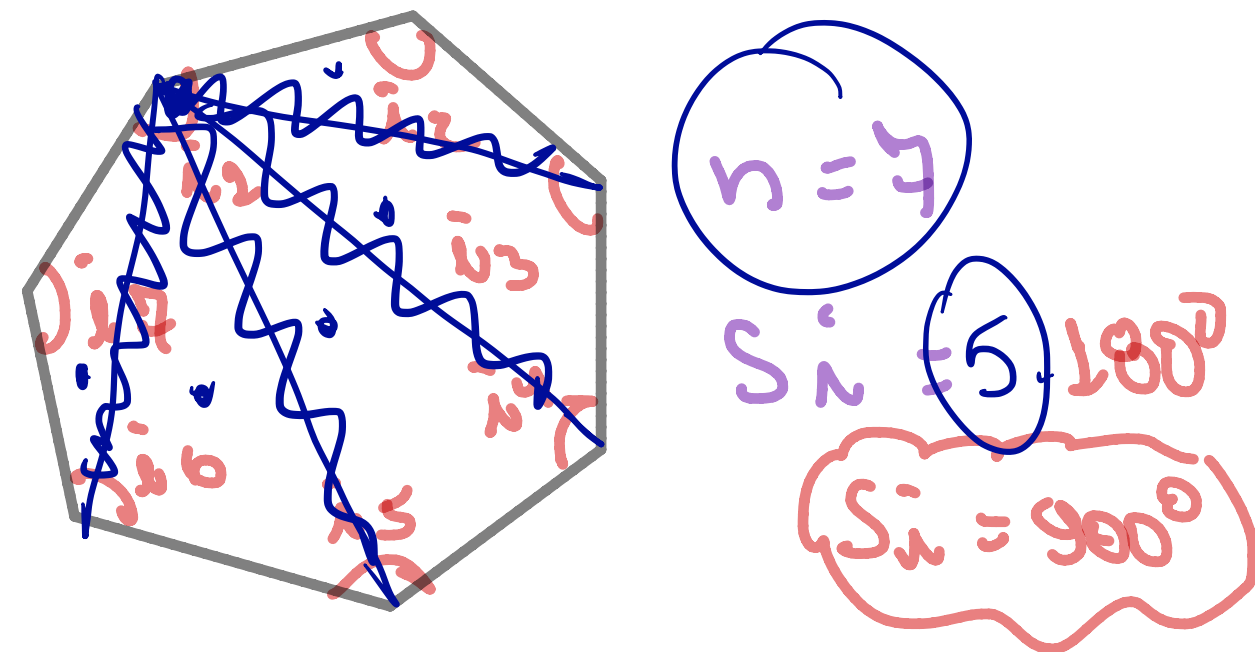
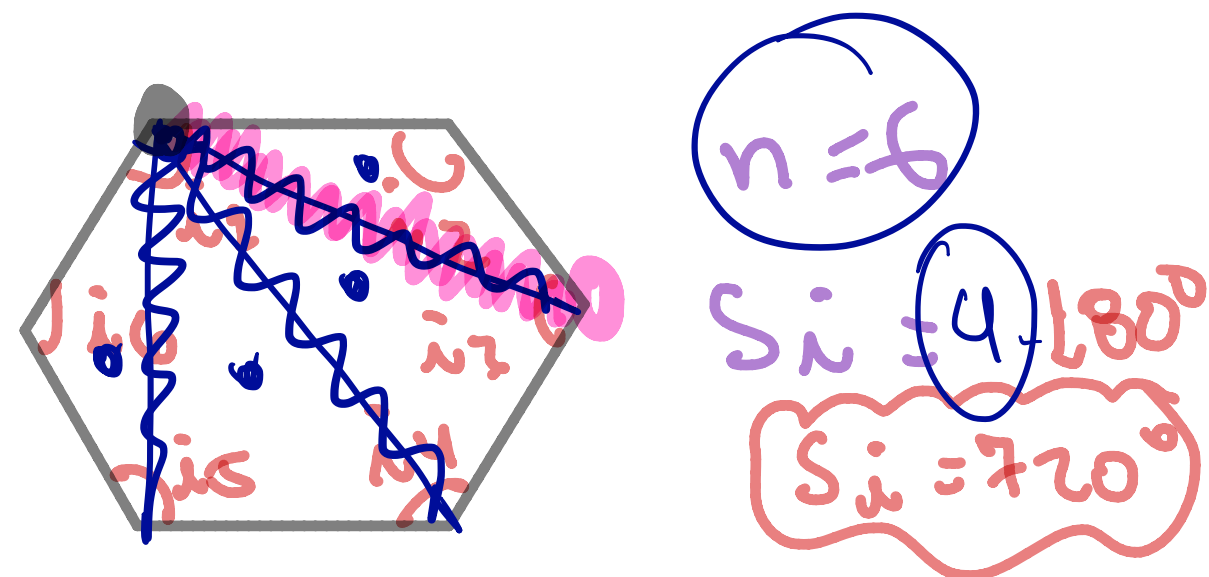
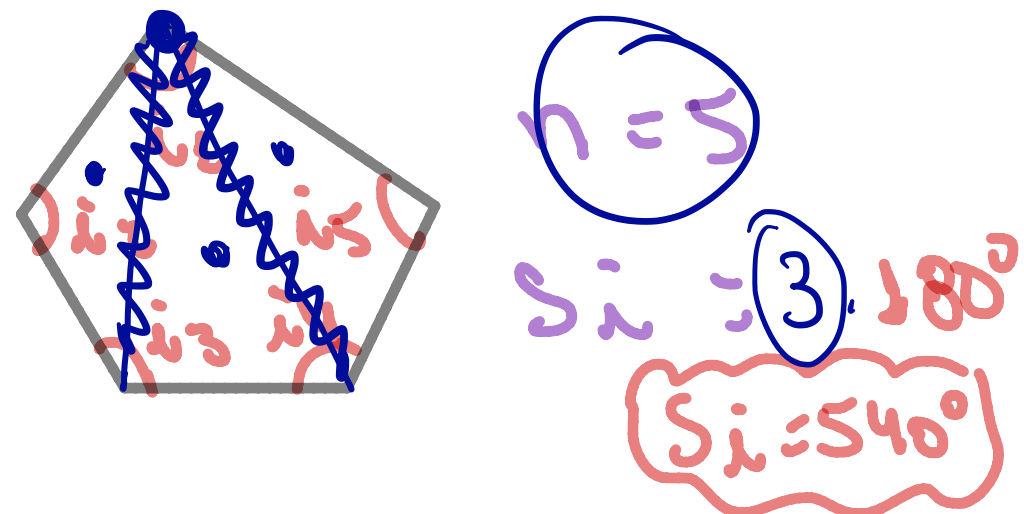
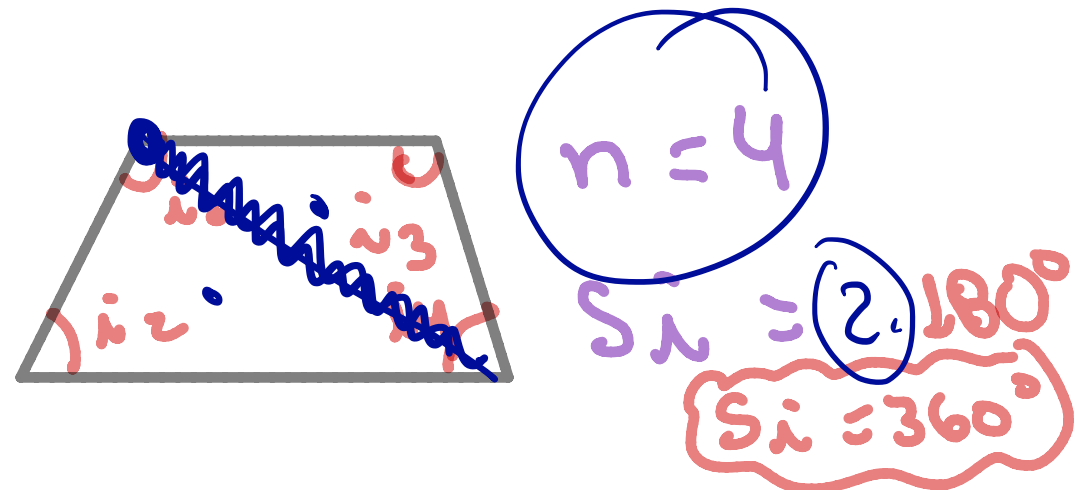
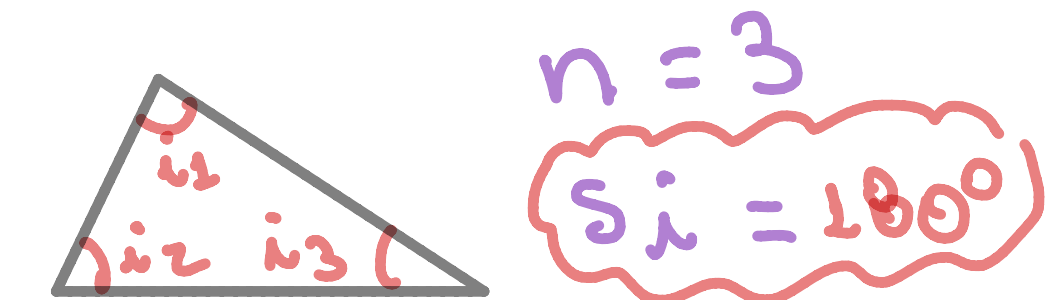
; $S_i = 1800^\circ$

$(n-2) \cdot 180^\circ = 1800^\circ$

$n-2 = 10$

$n = 12$ lados
(doodecágono)

Demonstrando 360°



...

$$S_i = (n-2) \cdot 180^\circ$$

$S_e = 360^\circ = ?$

$$\begin{array}{l} i_1 + e_1 = 180^\circ \\ i_2 + e_2 = 180^\circ \\ i_3 + e_3 = 180^\circ \\ \vdots \\ i_n + e_n = 180^\circ \end{array}$$

$$S_i + S_e = n \cdot 180^\circ$$

$$(n-2) \cdot 180^\circ + S_e = n \cdot 180^\circ$$

$$180n - 360^\circ + S_e = n \cdot 180^\circ$$

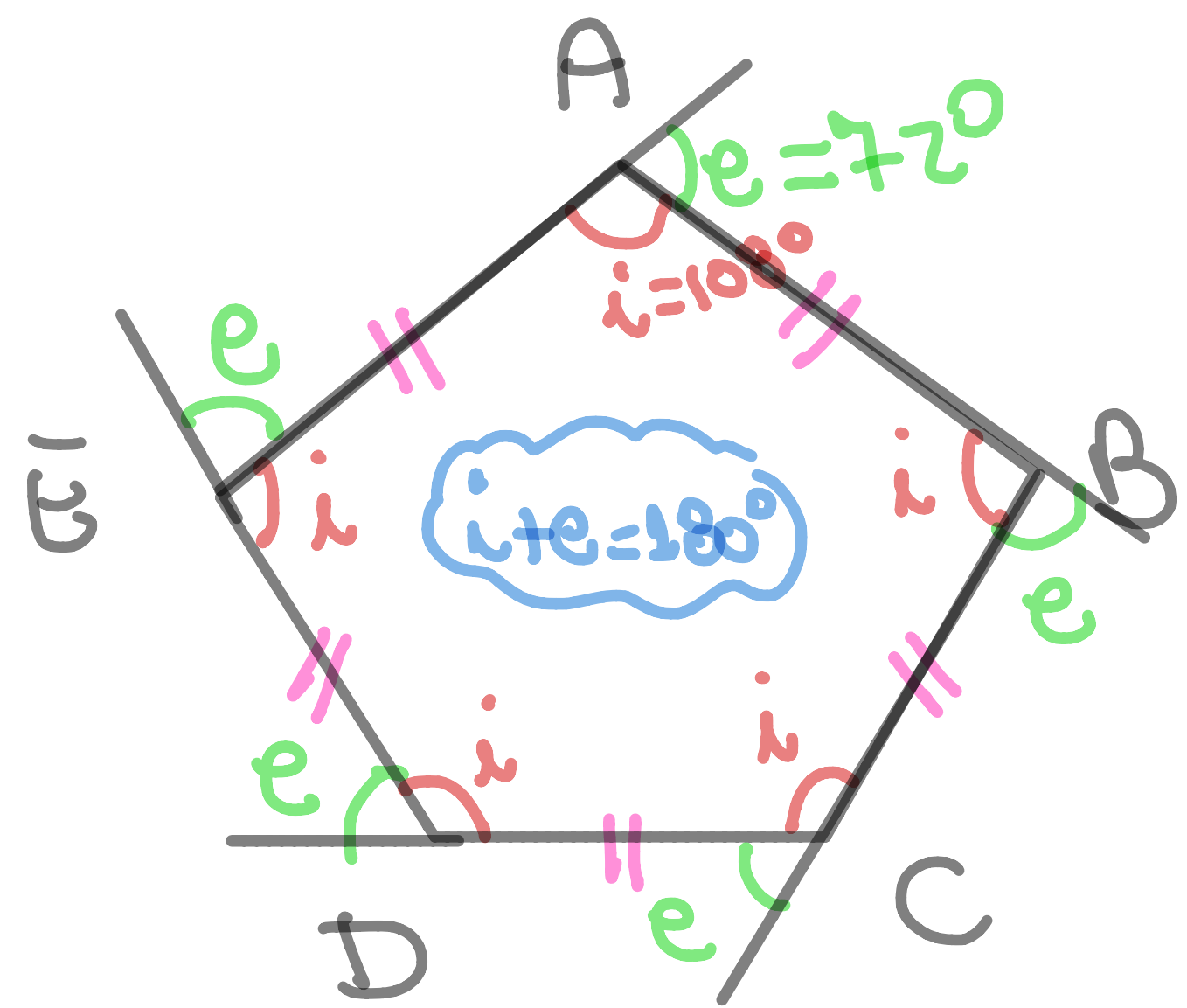
$$S_e = 360^\circ$$

$D = ?$

$D_{\text{cada vértice}} = n - 3 \Rightarrow D_{\text{tot}} = ?$
 $D_{\text{tot}} = \frac{n(n-3)}{2}$

5) POLÍGONOS REGULARES

(Lados e ângulos iguais) //



(Pentágono Regular)

$$i = \frac{Si}{n}$$

$$\Rightarrow i = \frac{(n-2) \cdot 180^\circ}{n}$$

$$e = \frac{Se}{n}$$

$$\Rightarrow e = \frac{360^\circ}{n}$$

(much better!) //

Exemplo 4 $i, e = ?$

a) Pentágono Regular

$$e = \frac{360^\circ}{n} = \frac{360^\circ}{5} = 72^\circ \Rightarrow i = 108^\circ //$$

b) Enégon regular

$$e = \frac{360^\circ}{n} = \frac{360^\circ}{9} = 40^\circ \Rightarrow i = 140^\circ //$$

c) Icoságono Regular

$$e = \frac{360^\circ}{n} = \frac{360^\circ}{20} = 18^\circ \Rightarrow i = 162^\circ //$$

Exemplo 5) Determino o nº de diagonais de um polígono regular cuja medida do ângulo interno é igual ao triplo da medida do externo.

Porque casu

• αφρασιζυγημ (poligonos)

• αλ αω (τιπο νομηλ)

É VIDA 1/1

Exemplo 6

- ABCDEF é um HEXÁGONO REGULAR
- DEGH é um QUADRADO
- $\hat{FGE} = ?$

