

**2ª
SÉRIE**

CANAL SEDUC-PI2



PROFESSOR (A):

ALEXSANDRO KESLLER



DISCIPLINA:

MATEMÁTICA



CONTEÚDO:

**GEOMETRIA
ESPACIAL
(POLIEDROS)**



TEMA GERADOR:

**CIÊNCIA
NA ESCOLA**



DATA:

07.08.2019

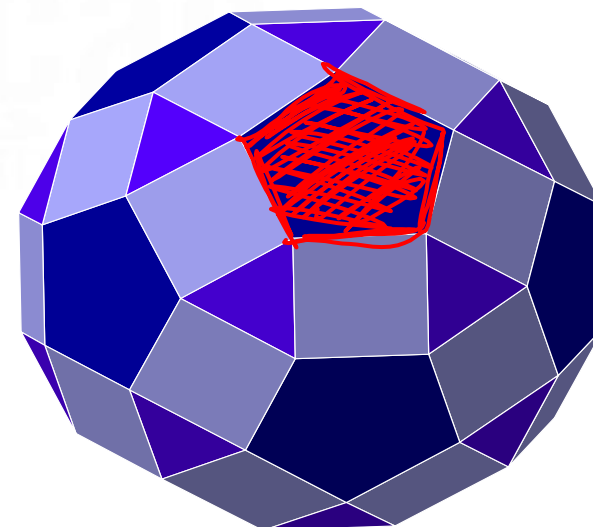
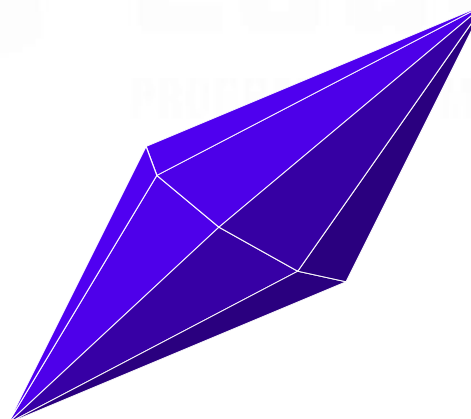
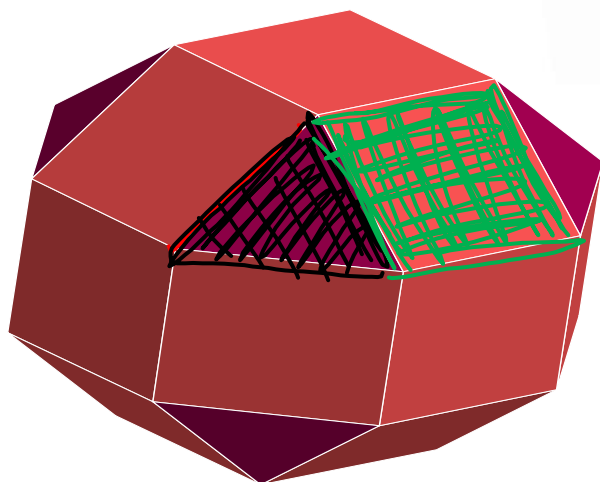
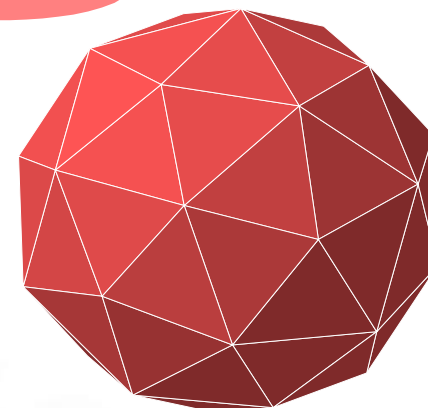
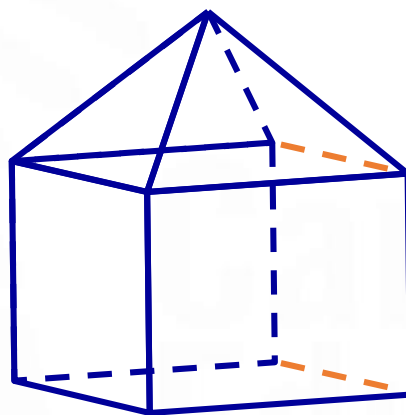
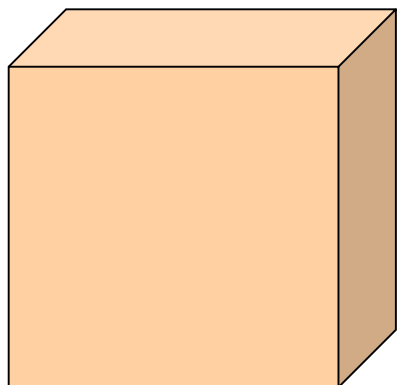
ROTEIRO DE AULA

GEOMETRIA ESPACIAL I- (POLIEDROS)

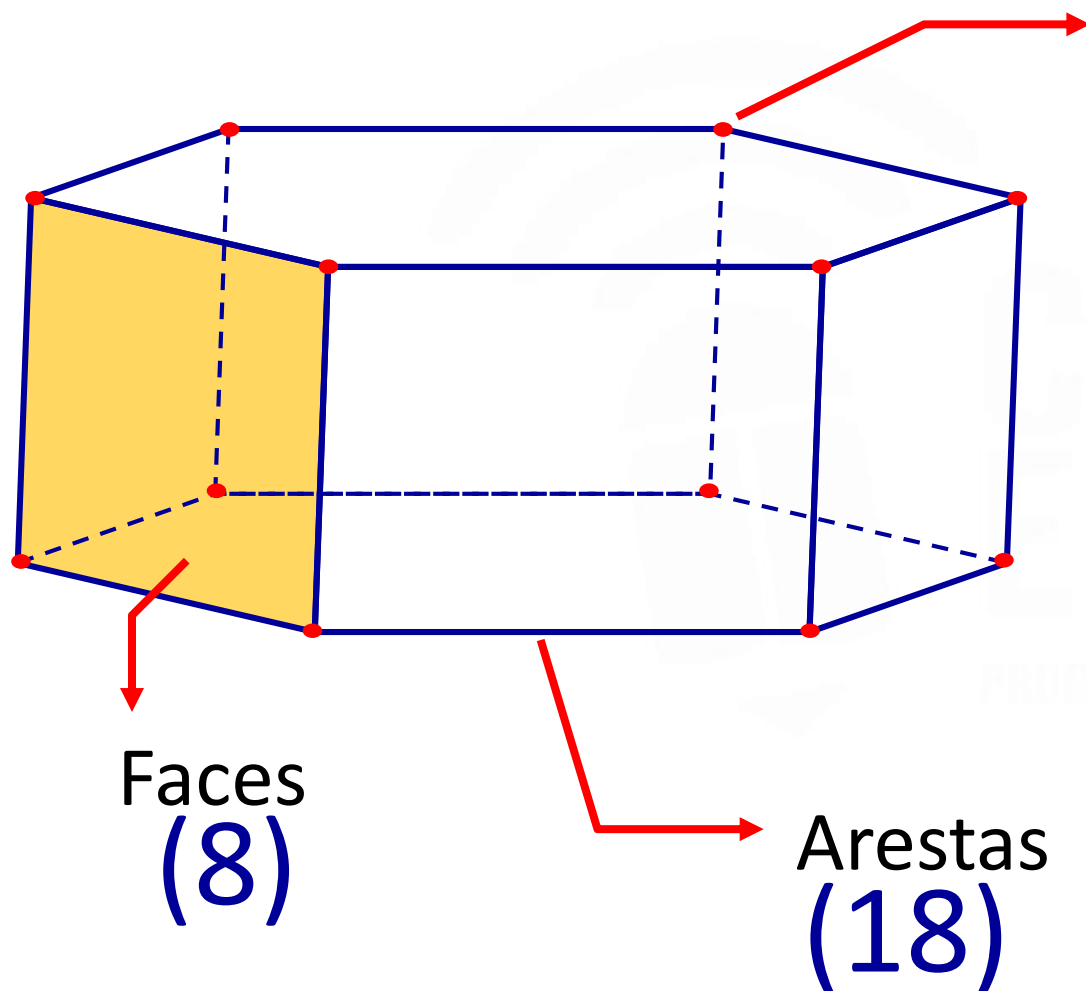
- Definição e elementos;
- Relação de Euler

POLIEDROS

Sólidos geométricos limitados por polígonos.



Elementos do Poliedro



Vértices
(12)

$$V - A + F = 2$$

Relação de Euler

$$V + F = A + 2$$

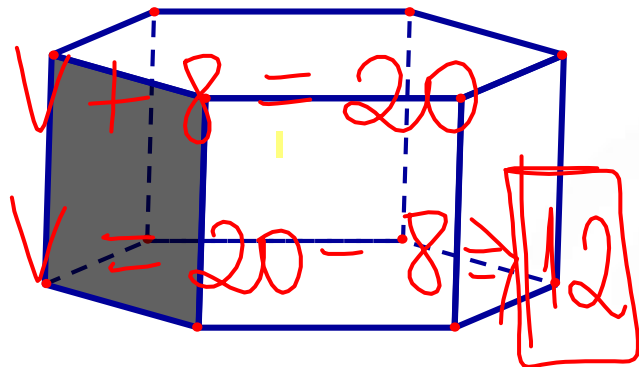
$$12 + 8 = 18 + 2$$

$$20 = 20 \quad \checkmark$$

Elementos do Poliedro

Qual a quantidade de vértices, arestas e faces de um poliedro limitado por seis faces quadrangulares e duas faces hexagonais?

$$V + 8 = 18 + 2$$



$$\begin{array}{r} + \quad 6_{F4} \\ \quad 2_{F6} \\ \hline F = 8 \end{array}$$

$$A = \frac{6(4) + 2(6)}{2}$$

$$A = \frac{24 + 12}{2} = \frac{36}{2}$$

$$A = 18$$

$$V + F = A + 2$$

$$V + 8 = 18 + 2$$

$$V = 12$$

Exemplo Proposto

Um poliedro possui cinco faces triangulares, cinco faces quadrangulares e uma pentagonal, determine as arestas, faces e vértices.

$$\begin{array}{r} 5 F(3) \\ + 5 F(4) \\ 1 F(5) \\ \hline \end{array}$$

$$F = 11$$

$$A = \frac{5(3) + 5(4) + 1(5)}{2}$$

$$A = \frac{15 + 20 + 5}{2}$$

$$\textcircled{V} + \textcircled{F} = \textcircled{A} + 2$$

$$A = \frac{40}{2} \Rightarrow$$

$$A = 20$$

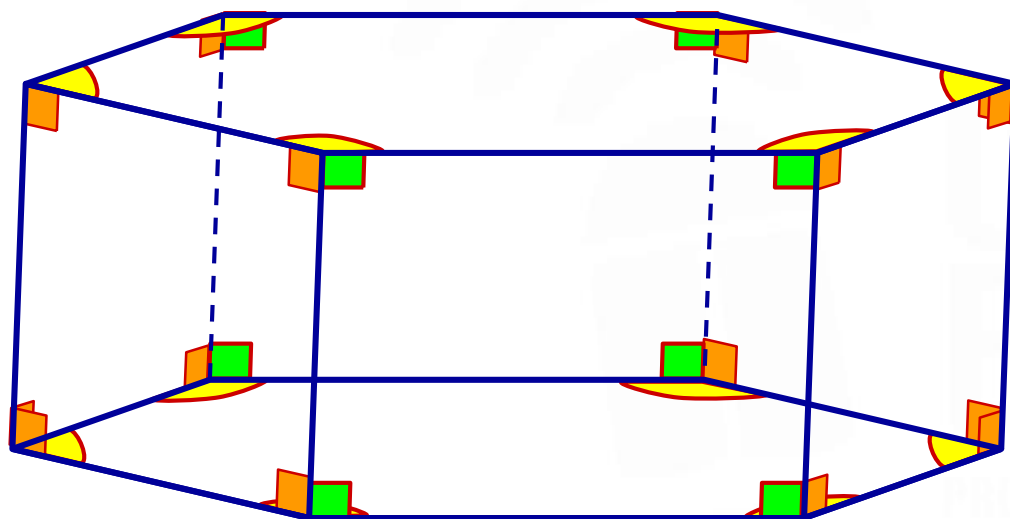
$$V + 11 = 20 + 2$$

$$V = 11$$

$$V + 11 = 22 \rightarrow V = 22 - 11 \rightarrow$$

Soma dos ângulos das faces

Nº VÉRTICES



$$S = (V - 2) \cdot 360^\circ$$

$$S = (12 - 2) \cdot 360^\circ$$

$$S = (10) \cdot 360^\circ$$

$$S = 3600^\circ$$

Atividade Proposta

Qual o número de vértices de um poliedro convexo de 10 faces quadrangulares

$$\begin{array}{r}
 + 10_{F(4)} \\
 \hline
 F = 10 \quad \checkmark
 \end{array}$$

$$A = \frac{10(4)}{2}$$

$$A = \frac{40}{2}$$

$$A = 20 \quad \checkmark$$

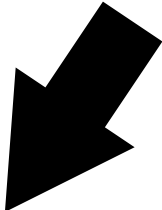
$$V + F = A + 2$$

$$V + 10 = 20 + 2$$

$$V + 10 = 22$$

$$V = 22 - 10 \rightarrow$$

$$V = 12$$



Atividade Proposta

Um poliedro convexo possui 9 faces triangulares, 9 faces quadrangulares, 1 face pentagonal e 1 face hexagonal. Quantos vértices tem esse poliedro?

$$\begin{array}{r}
 9_{F(3)} \\
 9_{F(4)} \\
 + 1_{F(5)} \\
 1_{F(6)} \\
 \hline
 F = 20
 \end{array}$$

$$A = \frac{9(3) + 9(4) + 1(5) + 1(6)}{2}$$

$$A = \frac{27 + 36 + 5 + 6}{2}$$

$$A = 37$$

$$V + F = A + 2$$

$$V + 20 = 37 + 2$$

$$V = 19$$

Atividade Proposta

Um poliedro convexo possui 3 faces pentagonais e algumas faces triangulares. Qual o número de faces desse poliedro, sabendo que o número de arestas é o quádruplo do número de faces triangulares?

$$\textcircled{\times} = ?$$

$$+ \begin{array}{l} 3F(5) \\ X F(3) \end{array}$$

$$F = 3 + x$$

$$F = 3 + 3$$

$$F = 6$$

$$\textcircled{A} = \frac{3(5) + x(3)}{2}$$

~~$$\textcircled{4x} = \frac{15 + 3x}{2}$$~~

$$8x = 15 + 3x$$

$$5x = 15$$

$$x = 3$$