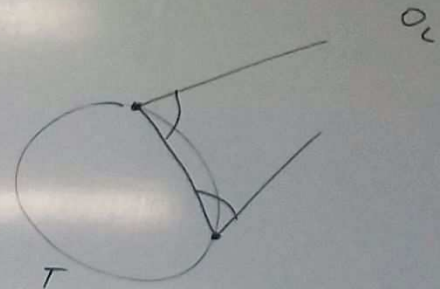
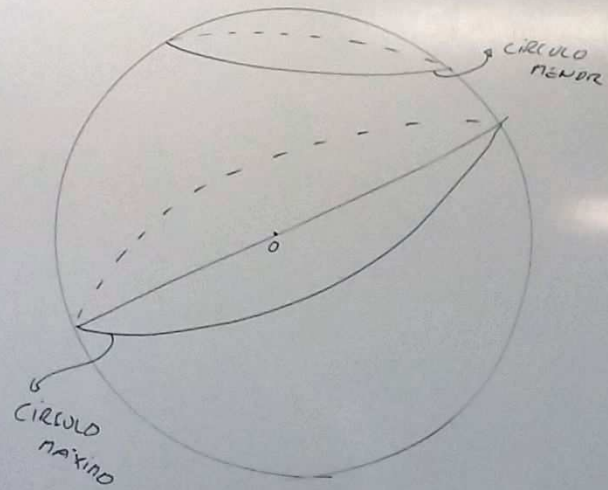
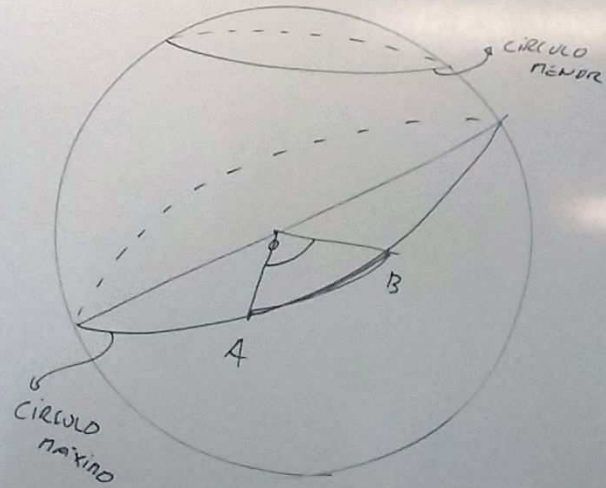


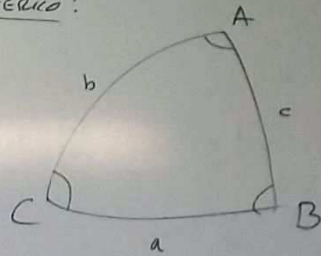
① TRIG. ESFÉRICA



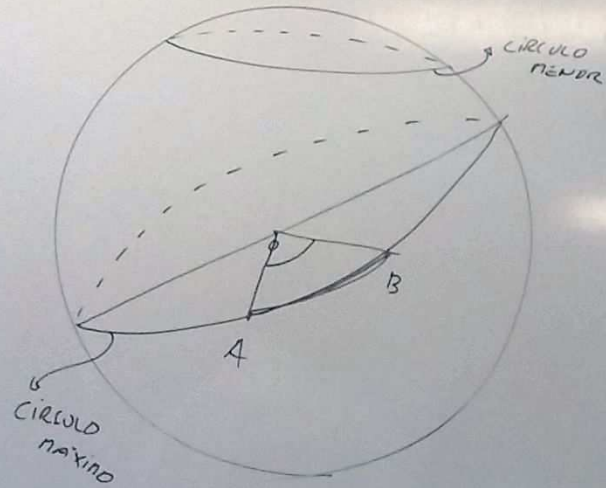
① TRIG. ESFÉRICA



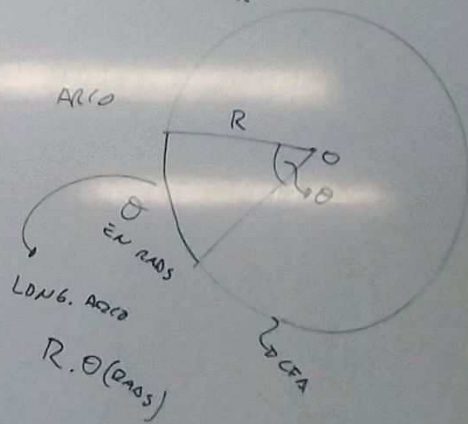
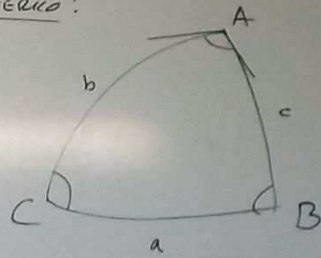
DESFERICO:



① TRIG. ESFÉRICA



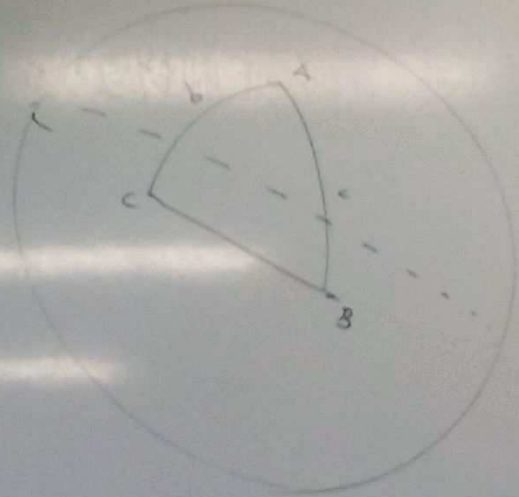
DESFÉRICO:



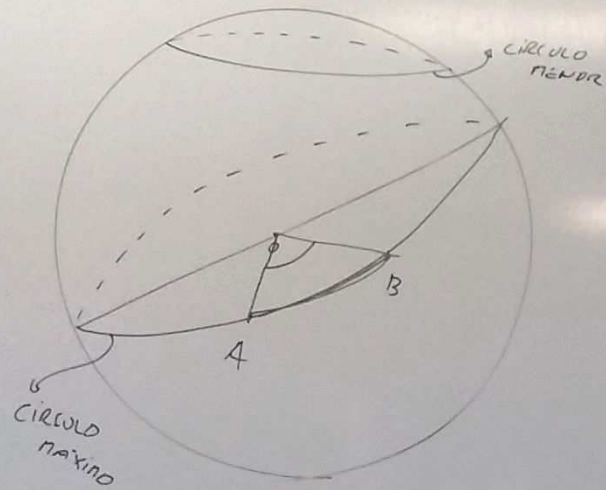
$$\pi \rightarrow 180^\circ$$

$$a, b, c \leq \pi$$

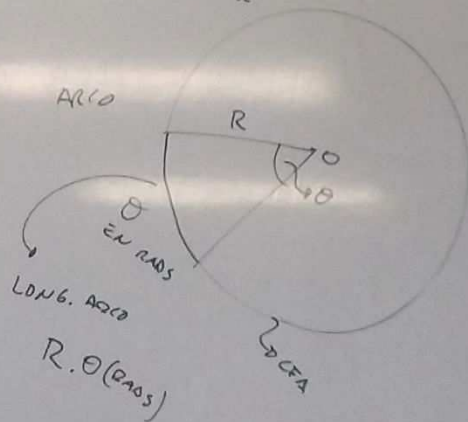
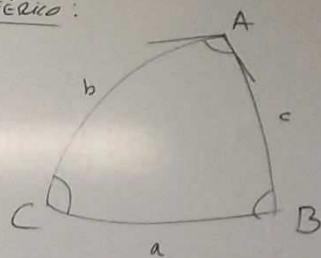
$$\pi < A + B + C < 3\pi$$



① TRIG. ESFÉRICA



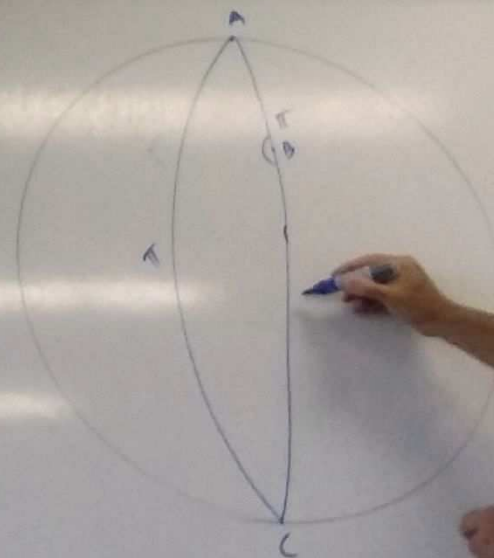
DESFÉRICO:



$$\pi \rightarrow 180^\circ$$

$$a, b, c \leq \pi$$

$$\pi < A + B + C < 3\pi$$



① TRIG. ESFÉRICA

ESFERA
ÁREA $4\pi \cdot R^2$

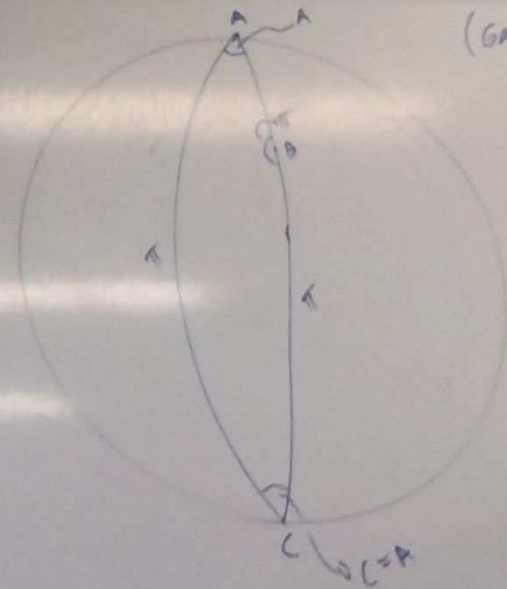
$A = 2\pi \rightarrow$ AREA "base" 4π

$$\pi \rightarrow 180^\circ$$

$$a, b, c \leq \pi$$

$$\pi < A + B + C < 3\pi$$

TRIÁNGULO BI-ÁNGULO
(GAL)



① TRIG. ESFÉRICATEO GIRARD : ÁREA DE Δ ESFÉRICOESFERA
ÁREA $4\pi \cdot R^2$

$$A = 2\pi \longrightarrow \text{ÁREA "base"} \\ 4\pi$$

$$A \longrightarrow 2A \\ \uparrow \\ \text{ÁREA GAÜD}$$



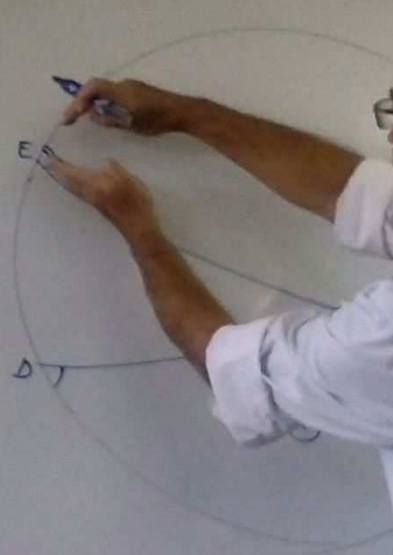
① TRIG. ESFÉRICA

TEO GIRARD : ÁREA DE Δ ESFÉRICO

ESFERA
ÁREA $4\pi \cdot R^2$

$A = 2\pi$ → ÁREA "caso" 4π

A → $2A$
↑
ÁREA GAUO



Δ ?

CASO A : $\textcircled{1} + \Delta$

CASO B :

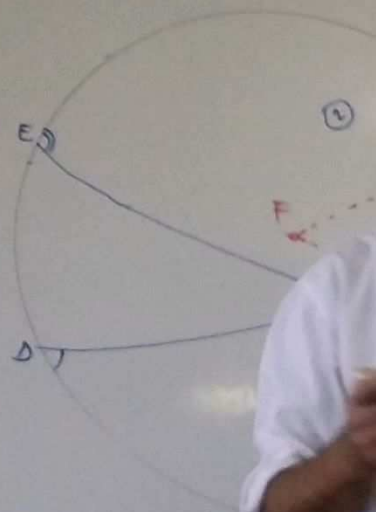
① TRIG. ESFÉRICA

TEO GIRARD : ÁREA DE Δ ESFÉRICO

ESFERA
ÁREA $4\pi \cdot R^2$

$A = 2\pi$ → ÁREA "cabo"
 4π

A → $2A$
↑
ÁREA GAUO



¿ Δ ?

CASO A : ① + Δ = $2A$

CASO B : ② + Δ = $2B$

CASO C : ~~ÁREA~~ + Δ = $2C$

① TRIG. ESFÉRICA

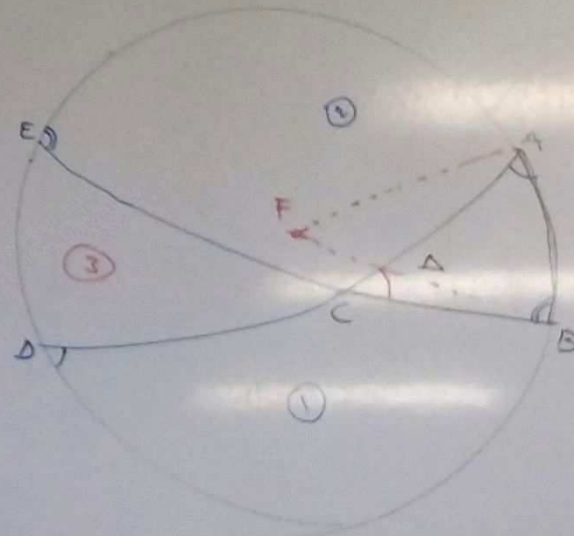
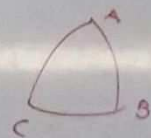
TEO GIRARD : ÁREA DE Δ ESFÉRICO

$$\text{ÁREA } \Delta = A + B + C - \pi$$

ESFERA
ÁREA $4\pi \cdot R^2$

$A = 2\pi \rightarrow$ ÁREA "cabo" 4π

$A \rightarrow 2A$
ÁREA GAJO



Δ ?

GAJO A : ① + Δ = $2A$

GAJO B : ② + Δ = $2B$

GAJO C : $\overline{A'B'C'}$ + Δ = $2C$

① + ② + ③ + 3Δ = $2(A+B+C)$

① + ② + ③ + Δ + 2Δ = $2(A+B+C)$

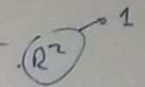
2π

① TRIG. ESFÉRICA

TEO GIRARD : ÁREA DE Δ ESFÉRICO

ÁREA $\Delta = A + B + C$

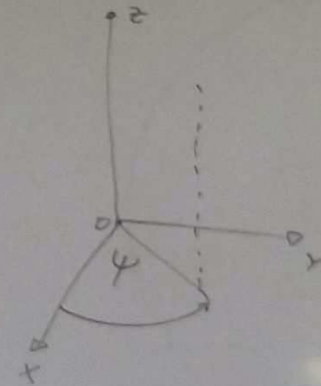
EXCESO ESFÉRICO



$A = 2\pi$ → ÁREA "base" 4π

A → $2A$
 ↑
 ÁREA GADDO

COORD. ESFÉRICAS



① TRIG. ESFÉRICATEO GIRARD: ÁREA DE Δ ESFÉRICO

$$\text{ÁREA } \Delta = A + B + C - \pi$$

EXCESO ESFÉRICO

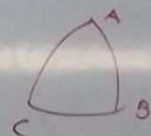
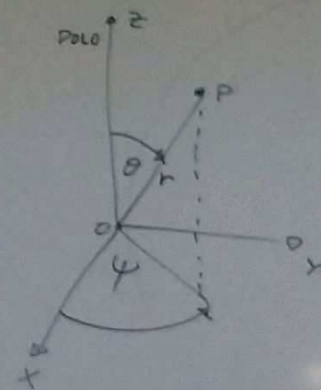
ESFERA
ÁREA

$$4\pi \cdot R^2$$

$$A = 2\pi \rightarrow \text{ÁREA "base" } 4\pi$$

$$A \rightarrow 2A$$

↑
ÁREA GAJD

COORD. ESFÉRICAS
 $0 \leq \psi < 360$
ACIMUTAL

 $0 \leq \theta < 180$
POLAR
 (ψ, θ)

XY: PLANO FUNDAMENTAL

RECTANGULARES:

$$z = r \cdot \cos \theta$$

$$y = r \cdot \sin \theta \cdot \sin \psi$$

$$x = r \cdot \sin \theta \cdot \cos \psi$$