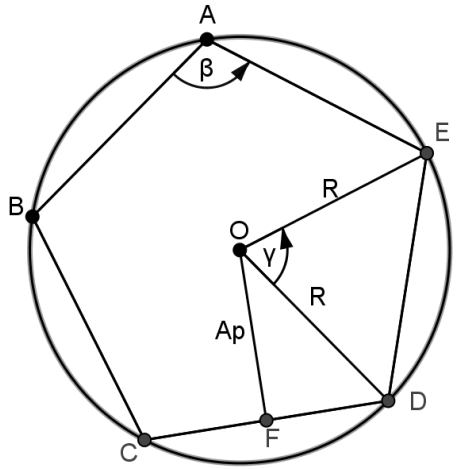
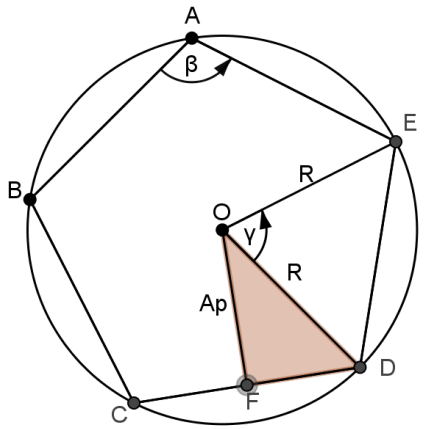
FORMULAS
DE APLICACIÓN

MATEMATICA 1C

POLIGONOS REGULARES SUPERFICIES



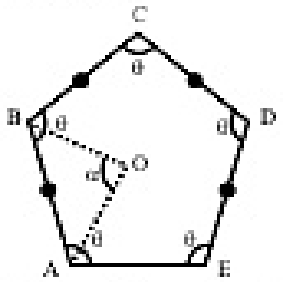


- Superficie= $\frac{perímetro\ x\ apotema}{2}$

- Superficie= 2x n x Sup. trianguloOFD

n: número de lados del polígono regular.

- Polígono Regular: Cuando los ángulos y lados tienen la misma medida.



Donde: "O" es el centro del polígono.

PROPIEDADES

I. Relación de lados, vértices, ángulo:

Nº vértices = Nº lados = Nº ángulos = n

II. Suma de medidas de los ángulos interiores (Si):

$$Si = 180\,(n - 2)$$

n = numero de lados

III. Suma de medidas de los ángulos exteriores (Se):

$$Se = 360°$$

IV. Medida de un ángulo interior en polígonos equiángulos ($\measuredangle i$):

$$\measuredangle i = \frac{180\,(n - 2)}{n}$$

n = numero de lados

V. Medida de un ángulo exterior en polígonos equiángulos ($\measuredangle e$):

$$\measuredangle e = \frac{360}{n}$$

NOTA

Solo en polígono regular
Ángulo central = ángulo exterior

$$\measuredangle c = \measuredangle e$$

VI. Suma de un ángulo interior y un ángulo exterior:

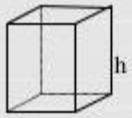
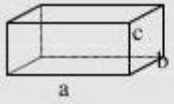
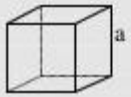
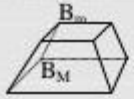
$$\measuredangle i + \measuredangle e = 180°$$

Número Total Diagonales en Polígono de "n" lados $= \dfrac{n(n-3)}{2}$

Número de diagonales por vértice en un polígono regular

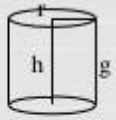
$$d = n - 3$$

FÓRMULAS DE LAS ÁREAS Y VOLÚMENES DE LOS CUERPOS GEOMÉTRICOS

Cuerpos	Área total (A_T)	Área lateral (A_L)	Área base/s (A_B)	Volumen (V)
PRISMAS RECTOS 	$A_T = A_L + 2A_B$	$A_L = P_B \cdot h$	$A_B = \begin{cases} \frac{b \cdot a}{2} & (1) \\ l^2 & (2) \\ \frac{P \cdot ap}{2} & (3) \end{cases}$	$V = A_B \cdot h$
ORTOEDRO 	$A_T = 2ab+2ac+2bc$	$A_L = 2ac+2bc$	$A_B = 2ab$	$V = a \cdot b \cdot c$
CUBO 	$A_T = 6a^2$	$A_L = 4a^2$	$A_B = 2a^2$	$V = a^3$
PIRÁMIDES RECTAS 	$A_T = A_L + A_B$	$A_L = \frac{P_B \cdot ap}{2}$	$A_B = \begin{cases} \frac{b \cdot a}{2} & (1) \\ l^2 & (2) \\ \frac{P \cdot ap}{2} & (3) \end{cases}$	$V = \frac{1}{3} A_B \cdot h$ ó $V = \frac{A_B \cdot h}{3}$
TRONCO DE PIRÁMIDE 	$A_T = A_L + A_{BM} + A_{Bm}$	$A_L = \frac{(B+b) \cdot a}{2} \cdot n$	A_B = igual que en la pirámide	

$$V_{Pir\ truncada} = \frac{h}{3}(A + A` + \sqrt{(A\ x\ A`)}$$

FÓRMULAS DE LAS ÁREAS Y VOLÚMENES DE LOS CUERPOS GEOMÉTRICOS

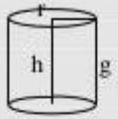
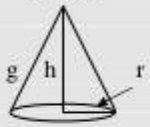
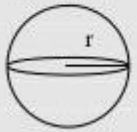
Cuerpos	Área total (A_T)	Área lateral (A_L)	Área base/s (A_B)	Volumen (V)
CILINDRO 	$A_T = A_L + 2A_B$ $A_T = 2\pi rg + 2\pi r^2$	$A_L = 2\pi rg$	$A_B = \pi r^2$	$V = \pi r^2 \cdot h$
CONO 	$A_T = A_L + A_B$ $A_T = \pi rg + \pi r^2$	$A_L = \pi rg$	$A_B = \pi r^2$	$V = \frac{1}{3} \cdot \pi r^2 \cdot h$ ó $V = \frac{\pi r^2 \cdot h}{3}$
TRONCO DE CONO 	$A_T = \pi g(R+r) + \pi R^2 + \pi r^2$	$A_L = \pi g \cdot (R+r)$	$A_{BM} = \pi R^2$ $A_{Bm} = \pi r^2$	
ESFERA 	$A = 4\pi r^2$			$V = \frac{4}{3} \cdot \pi r^3$

(1) Base triangular (b=base, a=altura). (2) Base cuadrada (l=lado). (3) Polígono regular (P=perímetro, ap=apotema).

https://www.pinterest.es/pin/448460075387018120/?lp=true

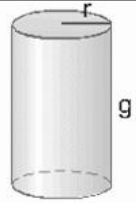
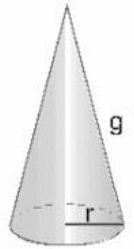
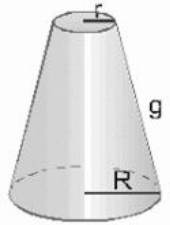
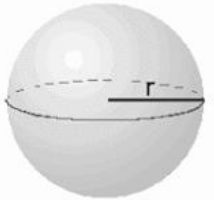
$$V_{cono\ truncado} = \frac{hx\pi}{3}(r_1^2 + r_2^2 + r_1\ x\ r_2)$$

Superficies y volúmenes de poliedros irregulares y superficies redondas

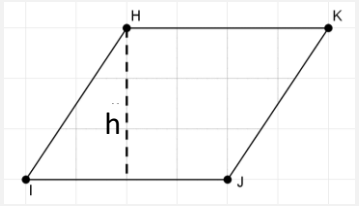
CILINDRO 	$A_T = A_L + 2A_B$ $A_T = 2\pi rg + 2\pi r^2$	$A_L = 2\pi rg$	$A_B = \pi r^2$	$V = \pi r^2 \cdot h$
CONO 	$A_T = A_L + A_B$ $A_T = \pi rg + \pi r^2$	$A_L = \pi rg$	$A_B = \pi r^2$	$V = \frac{1}{3} \cdot \pi r^2 \cdot h$ ó $V = \frac{\pi r^2 \cdot h}{3}$
TRONCO DE CONO 	$A_T = \pi g(R+r) + \pi R^2 + \pi r^2$	$A_L = \pi g \cdot (R+r)$	$A_{BM} = \pi R^2$ $A_{Bm} = \pi r^2$	
ESFERA 	$A = 4\pi r^2$			$V = \frac{4}{3} \cdot \pi r^3$

(1) Base triangular (b=base, a=altura). (2) Base cuadrada (l=lado). (3) Polígono regular (P=perímetro, ap=apotema).

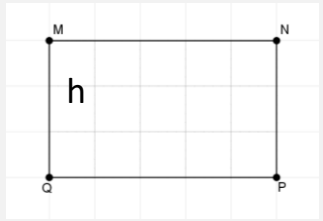
https://technologynatura.wordpress.com/2014/10/09/desarrollos-areas-y-volumenes-de-poliedros/

Área de cuerpos geométricos	
Figura	*Área*
 Cilindro	$A_{lateral} = 2\pi r \cdot g$ $A_{total} = 2\pi r \cdot (g + r)$
 Cono	$A_{lateral} = \pi r \cdot g$ $A_{total} = \pi r \cdot (g + r)$
 Tronco de cono	$A_{lateral} = \pi g \cdot (R + r)$ $A_{total} = \pi g \cdot (R + r) + \pi R^2 + \pi r^2$
 Esfera	$A = 4\pi r^2$

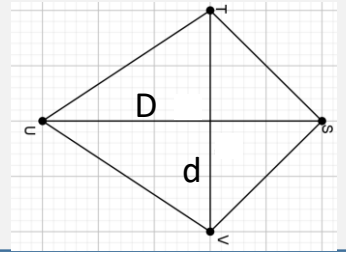
POLIGONOS IRREGULARES SUPERFICIES



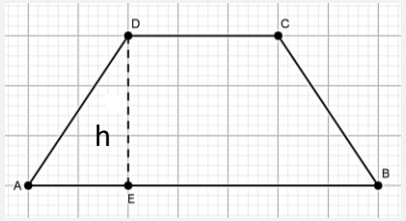
Sup=Base x h



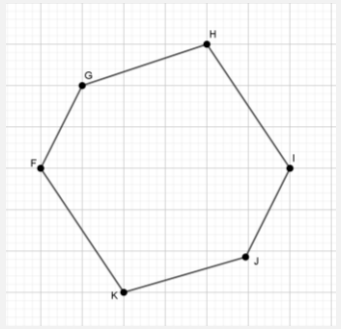
Sup=Base x h

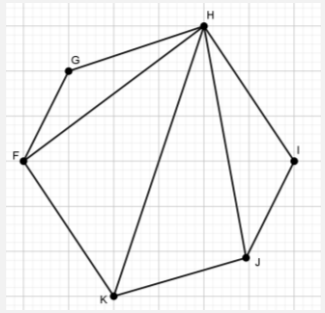


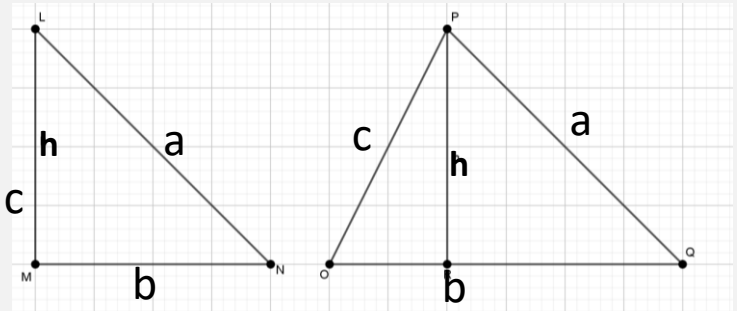
$$Sup=\frac{dxD}{2}$$



$$\frac{(Bm+bm)}{2}xh=Sup$$





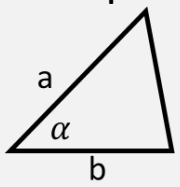


. Si los datos conocidos son solo los lados del triangulo:

S = $\sqrt{p(p-a)(p-b)(p-c)}$ **donde**

p= $\frac{a+b+c}{2}$

. Si se conocen solo dos lados y el ángulo entre ellos comprendido.



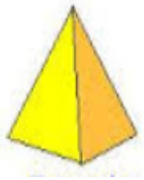
Sup= $\frac{a.b.sen\alpha}{2}$

Áreas y Volúmenes de Poliedros Regulares

Tetraedro

$$Sup = a^2 \; x \sqrt{3} = \; a^2 \; x \; 1,732050808$$

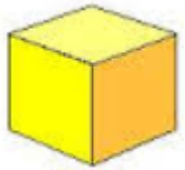
$$Vol = a^3 x \frac{\sqrt{2}}{12} = a^3 x \; 0,11785113$$



Hexaedro o Cubo

$$Sup = 6 \; a^2$$

$$Vol = a^3$$



Octaedro

$$Sup = 2 \; a^2 \; x \sqrt{3} = \; a^2 \; x \; 3,464101615$$

$$Vol = a^3 x \frac{\sqrt{2}}{3} = a^3 x \; 0,47140452$$

Dodecaedro

$$Sup = 3\ a^2\ x\ \sqrt{5(5+2\sqrt{5})} = \ a^2\ x\ 20,64572881$$

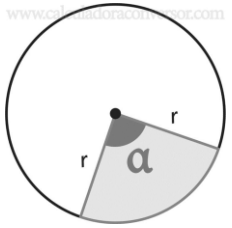
$$Vol = a^3 x \frac{(15+7\sqrt{5})}{4} = a^3 x\ 7,663118961$$

Icosaedro

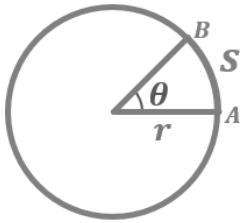
$$Sup = 5\ a^2\ x\ \sqrt{3} = \ a^2\ x\ 8,660254038$$

$$Vol = 5\ a^3 x \frac{(3+\sqrt{5}}{12} = a^3 x\ 2,181694991$$

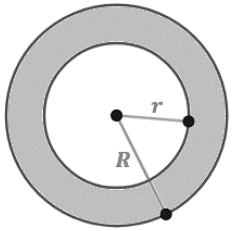
CALCULO DE AREAS Y PERIMETROS DE FIGURAS CURVAS PLANAS



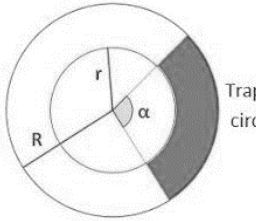
Área sector circular=$\frac{\pi.r^2.\alpha°}{360°}$



Longitud arco circunferencia "S"=$\frac{\pi.2.r.\theta°}{360°}$

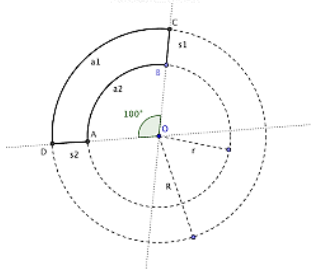


Área anillo circular=$\pi R^2 - \pi r^2$

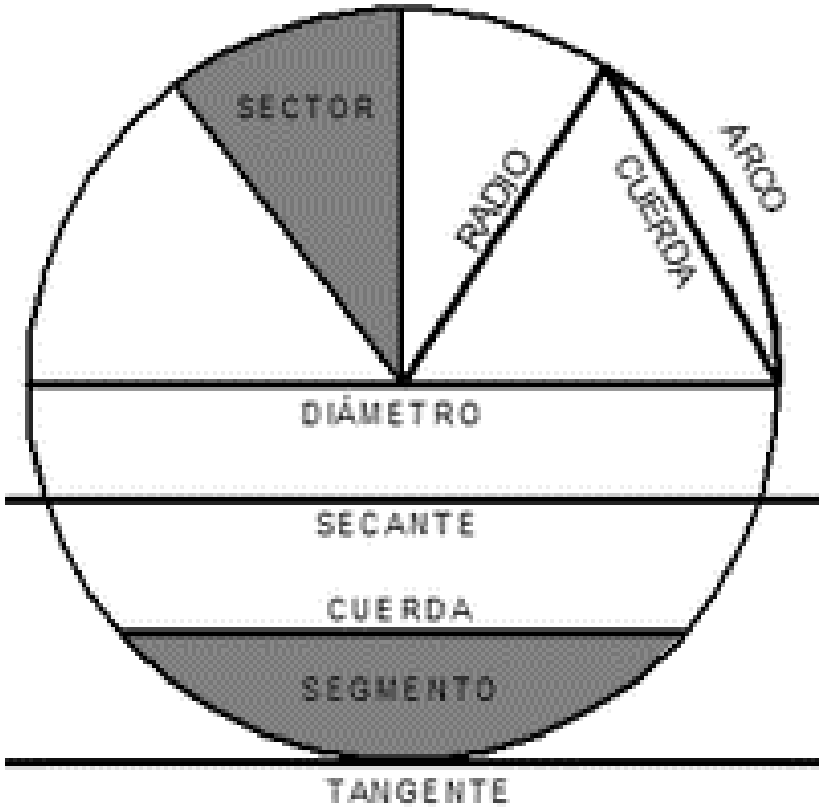


Trapecio circular

Area trapecio circular=$\frac{(\pi R^2 - \pi r^2).\alpha°}{360°}$



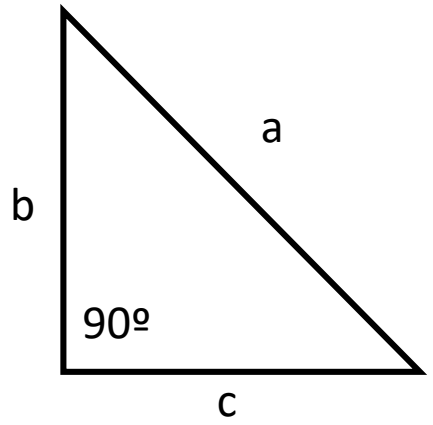
Perimetro trapecio circular= 2 (R-r)+ $\frac{(2\pi R + 2\ \pi r).\alpha°}{360°}$



ANGULOS SISTEMAS SEXAGESIMAL-CENTESIMAL Y RADIAN- TEOREMA DE PITÁGORAS- FUNCIONES TRIGONOMETRICAS

- $\frac{\alpha\ radian}{2\pi radianes} = \frac{\alpha\ °}{360°} = \frac{\alpha^G}{400^G}$ equivalencia entre los tres sistemas

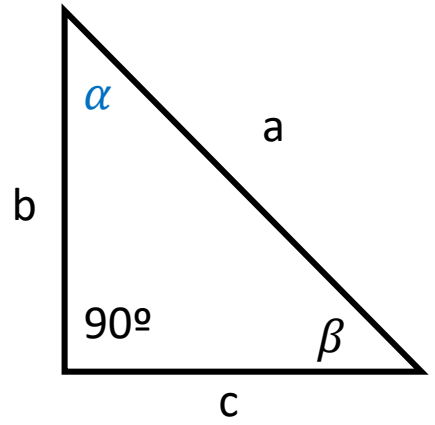
- TEOREMA DE PITAGORAS

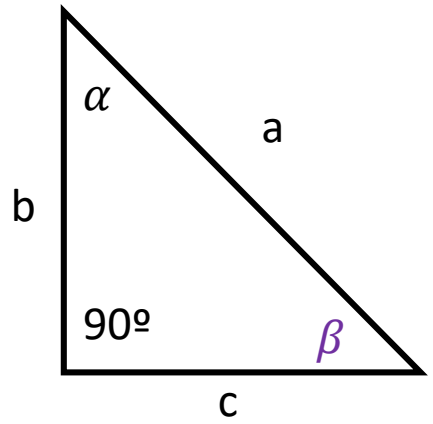


$$\boldsymbol{b^2 + c^2 = a^2}$$

Funciones trigonométricas

- Funciones trigonométricas del ángulo α
- $sen\ \alpha = \frac{cateto\ opuesto}{hipotenusa} = \frac{c}{a}$
- $cos\ \alpha = \frac{cateto\ adyacente}{hipotenusa} = \frac{b}{a}$
- $tag\ \alpha = \frac{cateto\ opuesto}{cateto\ adyacente} = \frac{c}{b}$
- Funciones trigonométricas del ángulo β
- $sen\ \beta = \frac{cateto\ opuesto}{hipotenusa} = \frac{b}{a}$
- $cos\ \beta = \frac{cateto\ adyacente}{hipotenusa} = \frac{c}{a}$
- $tag\ \beta = \frac{cateto\ opuesto}{cateto\ adyacente} = \frac{b}{c}$

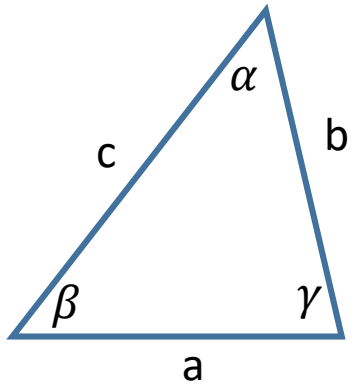




TEOREMAS DEL SENO Y DEL COSENO

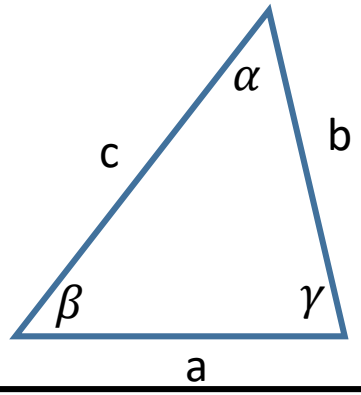
TEOREMA DEL SENO

- $\frac{a}{sen\alpha} = \frac{b}{sen\beta} = \frac{c}{sen\gamma}$



TEOREMA DEL COSENO

- $a^2 = b^2 + c^2 - 2b.c.\cos\alpha$
- $b^2 = a^2 + c^2 - 2a.c.\cos\beta$
- $c^2 = a^2 + b^2 - 2a.b.\cos\gamma$



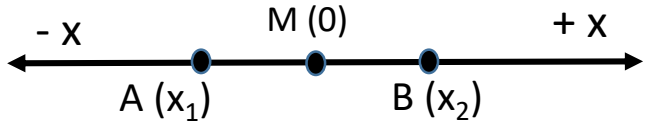
SISTEMAS DE COORDENADAS EN EL PLANO

A- Coordenadas cartesianas o rectangulares

SISTEMA UNIDIMENSIONAL:

- Distancia entre dos puntos :

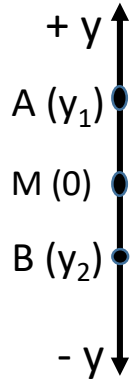
A- En horizontal:



Distancia entre:
Punto A (x_1) y Punto B (x_2)
IBAI =IABI = I(x_1 - x_2)I= I(x_2 – x_1)I

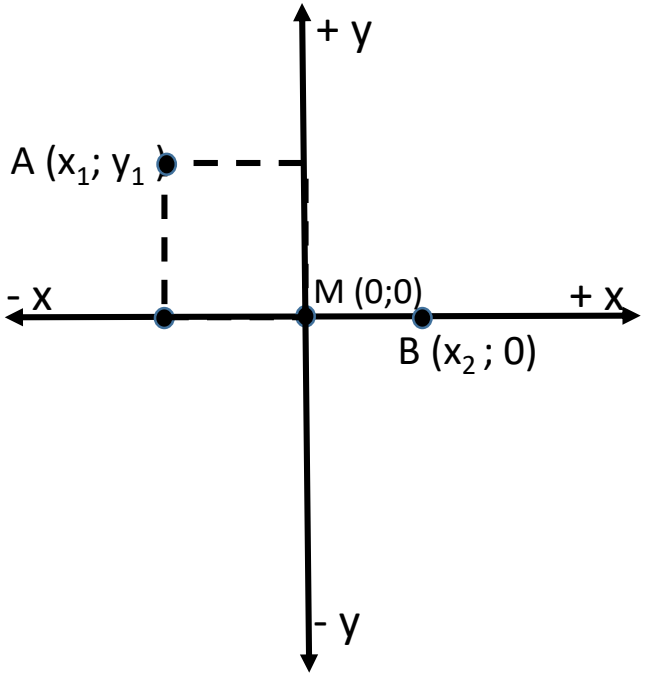
B- En vertical:

Distancia entre:
Punto A (x_1) y Punto B (x_2)
IBAI =IABI = I(x_1 - x_2)I= I(x_2 – x_1)I



SISTEMA BIDIMENSIONAL:

- Distancia entre dos puntos :

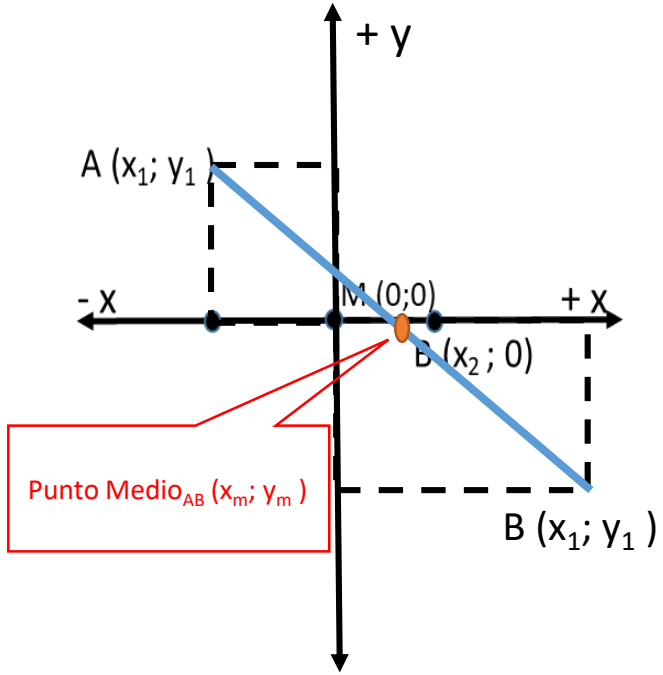


Distancia entre dos puntos

$$|BA|=|AB|=\sqrt{(X_1-X_2)^2+(Y_1-Y_2)^2}$$

SISTEMA BIDIMENSIONAL:

- Punto medio

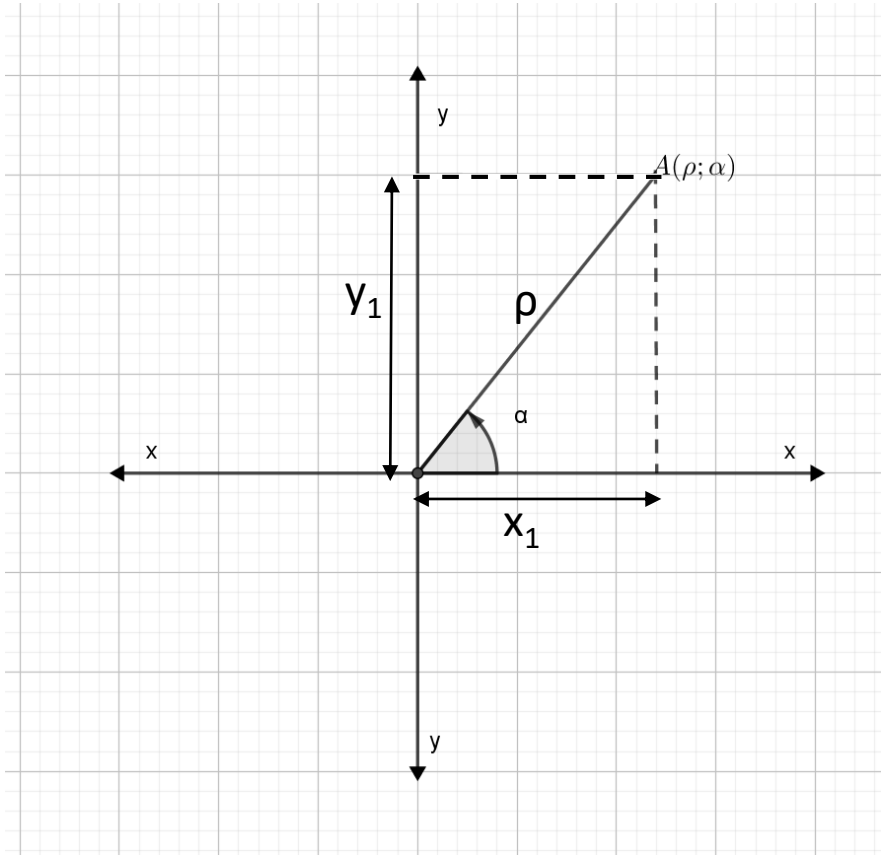


$X_m = \frac{x_1+x_2}{2}$ $y_m = \frac{y_1+y_2}{2}$

Coordenadas del punto medio

SISTEMAS DE COORDENADAS EN EL PLANO

A- Coordenadas polares



COORDENADAS POLARES DEL PUNTO "A"

- $\rho^2 = (X_1)^2 + (Y_1)^2$
- $\alpha = \text{arc.tg } (\frac{Y_1}{X_1})$

PASAJE DEL SISTEMA POLAR AL CARTESIANO

$x_1 = \rho \cdot \cos \alpha$

$y_1 = \rho \cdot \text{sen } \alpha$

PASAJE DEL SISTEMA CARTESIANO AL POLAR

- $\rho^2 = (X_1)^2 + (Y_1)^2$
- $\alpha = \text{arc.tg } (\frac{Y_1}{X_1})$