ECUACIÓN GENERAL DE 2º GRADO:

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

Propiedades de los logaritmos:

$$\log(ab)=\log a+\log b$$

$$\log\left(\frac{a}{b}\right)=\log a-\log b$$

$$\log a^n=n\log a \qquad \log\sqrt[n]{a}=\frac{1}{n}\log a$$

Identidades Trigonométricas:

$$\operatorname{sen}^2\alpha+\cos^2\alpha=1 \qquad \cot\alpha=\frac{\cos\alpha}{\operatorname{sen}\alpha}$$

$$tan\alpha=\frac{\operatorname{sen}\alpha}{\cos\alpha} \qquad \cot=\frac{1}{tan\alpha}$$

$$\sec\alpha=\frac{1}{\cos\alpha} \qquad \csc\alpha=\frac{1}{\operatorname{sen}\alpha}$$

$$\sec^2\alpha=1+tan^2\alpha \qquad \csc^2\alpha=1+\cot^2\alpha$$

GEOMETRÍA ANALÍTICA

$$d=\sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$$

Pendiente:

$$m=\frac{y_1-y_2}{x_1-x_2}$$

Punto Medio:

$$x=\frac{x_1+x_2}{2} \qquad y=\frac{y_1+y_2}{2}$$

División de Segmentos:

$$x=\frac{x_1+rx_2}{1+r} \qquad y=\frac{y_1+ry_2}{1+r}$$

Ángulo entre dos Rectas:

$$tan\theta_1=\frac{m_2-m_1}{1+m_2m_1} \qquad tan\theta_2=\frac{m_1-m_2}{1+m_1m_2}$$

ECUACIONES DE LA RECTA:

$$y-y_1=m(x-x_1)$$

$$y-y_1=\frac{y_1-y_2}{x_1-x_2}(x-x_1)$$

$$y=mx+b$$

$$\frac{x}{a}+\frac{y}{b}=1$$

Distancia de un punto a una recta:

$$d=\frac{|Ax+By+c|}{\pm\sqrt{A^2+B^2}}$$

ECUACIONES DE LA CIRCUNFERENCIA:

$x^2+y^2=r^2$ Centro en el origen.

$(x-h)^2+(y-k)^2=r^2$ Centro en (h,k)

$Ax^2+By^2+Dx+Ey+F=0$

$A=B$ y del mismo signo

ECUACIONES DE LA PARÁBOLA:

$y^2=4px \quad x^2=4py$ Vértice en el origen.

$(y-k)^2=4p(x-h)$

$(x-h)^2=4p(y-k)$ Vértice en (h,k)

$Ax^2+Dx+Ey+F=0$

$By^2+Dx+Ey+F=0$

Long. Lado recto = 4p.

ECUACIONES DE LA ELIPSE:

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1; \qquad \frac{x^2}{b^2}+\frac{y^2}{a^2}=1$$

$$\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$$

$$\frac{(x-h)^2}{b^2}+\frac{(y-k)^2}{a^2}=1$$

Long. Lado recto = $\frac{2b^2}{a}$ $\qquad c^2=a^2-b^2$

Excentricidad:

$$e=\frac{c}{a}=\frac{\sqrt{a^2-b^2}}{a}$$

ECUACIONES DE LA HIPÉRBOLA:

$$\frac{x^2}{a^2}-\frac{y^2}{b^2}=1 \qquad \frac{y^2}{a^2}-\frac{x^2}{b^2}=1$$

$$\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$$

$$\frac{(y-k)^2}{a^2}-\frac{(x-h)^2}{b^2}=1$$

Long. Lado recto= $\frac{2b^2}{a}$ $\qquad e=\frac{c}{a}$

FÓRMULAS PARA DERIVACIÓN:

$$\frac{d}{dx}(c)=0; \quad \frac{d}{dx}(x)=1;$$

$$\frac{d}{dx}(cv)=c\frac{d(v)}{dx}$$

$$\frac{d}{dx}(u+v-w)=\frac{d(u)}{dx}+\frac{d(v)}{dx}-\frac{d(w)}{dx}$$

$$\frac{d}{dx}(v^n)=n(v)^{n-1}\frac{d(v)}{dx}$$

$$\frac{d}{dx}(x^n)=nx^{n-1}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{v\frac{d(u)}{dx}-u\frac{d(v)}{dx}}{v^2}$$

$$\frac{d}{dx}\left(\frac{u}{c}\right)=\frac{\frac{d(u)}{dx}}{c}$$

$$\frac{d}{dx}(y)=\frac{d(y)}{dv}\cdot\frac{d(v)}{dx}$$; siendo y función de v

$$\frac{dy}{dx}=\frac{1}{\frac{dx}{dy}}$$; siendo y función de x

$$\frac{d}{dx}(\ln x)=\frac{1}{v}\frac{d(v)}{dx}$$

$$\frac{dv}{dx}(arc\sec v)=\frac{\frac{dv}{dx}}{v\sqrt{v^2-1}}$$

$$\frac{d}{dx}(\log v)=\frac{\log e}{v}\frac{dv}{dx}$$

$$\frac{d}{dx}(a^v)=a^v Ina\frac{dv}{dx}$$

$$\frac{d}{dx}(e^v)=e^v\frac{dv}{dx}$$

$$\frac{d}{dx}(u^v)=vu^{v-1}\frac{du}{dx}+\ln u\bullet u^v\frac{dv}{dx}$$

$$\frac{d}{dx}(senv)=\cos v\frac{dv}{dx}$$

$$\frac{d}{dx}(\cos v)=-senv\frac{dv}{dx}$$

$$\frac{d}{dx}(tgv)=\sec^2 v\frac{dv}{dx}\qquad\frac{d}{dx}(ctgv)=\csc^2 v\frac{dv}{dx}$$

$$\frac{d}{dx}(\sec v)=\sec vtgv\frac{dv}{dx}$$

$$\frac{d}{dx}(\csc v)=-\csc vctgv\frac{dv}{dx}$$

$$\frac{d}{dx}versv=senv\frac{dv}{dx}\qquad\frac{d}{dx}(arcsenv)=\frac{\frac{dv}{dx}}{\sqrt{1-v^2}}$$

$$\frac{d}{dx}(\arccos v)=-\frac{\frac{dv}{dx}}{\sqrt{1-v^2}}$$

$$\frac{d}{dx}(arctgv)=\frac{\frac{dv}{dx}}{1+v^2}$$

$$\frac{dv}{dx}(arc\sec v)=\frac{\frac{dv}{dx}}{v\sqrt{v^2-1}}$$

$$\frac{d}{dx}(arc\csc v)=-\frac{\frac{dv}{dx}}{v\sqrt{v^2-1}}$$

$$\frac{d}{dx}(arcversv)=\frac{\frac{dv}{dx}}{\sqrt{2v-v^2}}$$

FÓRMULA DE INTEGRACIÓN:

$$\int du+dv-dw=\int du+\int dv-\int dw$$

$$\int adv=a\int dv$$

$$\int dx=x+c$$

$$\int v^n dv=\frac{v^{n+1}}{n+1}+c$$

$$\int\frac{dv}{v}=Inv+c$$

$$\int a^v dv=\frac{a^v}{\ln a}+C$$

$$\int e^v dv=e^v+C$$

$$\int \operatorname{sen} v dv=-\cos v+C$$

$$\int \cos v dv=\operatorname{sen} v+C$$

$$\int \sec^2 v dv=tanv+C$$

$$\int \csc^2 v dv=-c\operatorname{tg} v+C$$

$$\int \sec vtanvdv=\sec v+C$$

$$\int \csc v\cot vdv=-\csc v+C$$

$$\int tanvdv=-\ln\cos v+C=\ln\operatorname{sen} v+C$$

$$\int \cot vdv=\ln\operatorname{sen} v+C$$

$$\int \sec vdv=\ln(\sec v+tanv)+C$$

$$\int \csc vdv=\ln(\csc v-\cot v)+C$$

$$\int\frac{dv}{v^2+a^2}=\frac{1}{a}arctan\frac{v}{a}+C$$

$$\int\frac{dv}{v^2-a^2}=\frac{1}{2a}\ln\frac{v-a}{v+a}+C$$

$$\int\frac{dv}{a^2-v^2}=\frac{1}{2a}\ln\frac{a+v}{a-v}+C$$

$$\int\frac{dv}{\sqrt{a^2-v^2}}=\operatorname{arcsen}\frac{v}{a}+C$$

$$\int\frac{dv}{\sqrt{v^2\pm a^2}}=\ln\left(v+\sqrt{v^2\pm a^2}\right)+C$$

$$\int\sqrt{a^2-v^2}dv=\frac{v}{2}\sqrt{a^2-v^2}+\frac{a^2}{2}\operatorname{arcsen}\frac{v}{a}+C$$

$$\int\sqrt{v^2\pm a^2}dv=\frac{v}{2}\sqrt{v^2\pm a^2}\pm\frac{a^2}{2}\ln(v+\sqrt{v^2\pm a^2})$$