FORMULARIO

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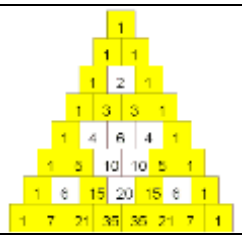
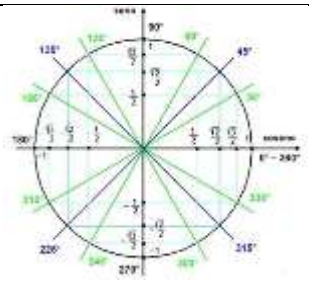
POTENZE	$a^m \cdot a^n = a^{m+n}$ $a^m : a^n = a^{m-n}$ $(a^m)^n = a^{m \cdot n}$ $a^m \cdot b^m = (a \cdot b)^m$ $a^m : b^m = (a : b)^m$	**TRIANGOLO DI TARTAGLIA**	
PRODOTTI NOTEVOLI	$(a+b)(a-b) = a^2 - b^2$ $(a \pm b)^2 = a^2 \pm 2ab + b^2$ $(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc$ $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ $(a+b)^n = \sum_{k=0}^{n} \binom{n}{k} a^k b^{n-k}$	**SOMMA X DIFFERENZA** **QUADRATO DI BINOMIO** **QUADRATO DI TRINOMIO** **CUBO DI BINOMIO** **POTENZA N-SIMA DI BINOMIO**	
EQUAZIONI di SECONDO GRADO COMPLETE $ax^2 + bx + c = 0$	$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x_{1,2} = \frac{-\left(\frac{b}{2}\right) \pm \sqrt{\left(\frac{b}{2}\right)^2 - ac}}{a}$		

COEFFICIENTE ANGOLARE $\frac{y_2 - y_1}{x_2 - x_1}$ **EQUAZIONE RETTA** $y - y_0 = m(x - x_0)$ **DISTANZA TRA 2 PUNTI** $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ **DISTANZA PUNTO RETTA** $d = \frac{\lvert ax_0 + by_0 + c \rvert}{\sqrt{a^2 + b^2}}$	**PARABOLA** $y = ax^2 + bx + c$ $V\left(-\frac{b}{2a}; -\frac{\Delta}{4a}\right)$ $F\left(-\frac{b}{2a}; \frac{1-\Delta}{4a}\right)$ **DIRETTRICE:** $y = -\frac{1+\Delta}{4a}$ **ASSE:** $x = -\frac{b}{2a}$
CIRCONFERENZA $x^2 + y^2 + ax + by + c = 0$ $C\left(-\frac{a}{2}; -\frac{b}{2}\right)$ $r = \frac{1}{2}\sqrt{a^2 + b^2 - 4c}$	**IPERBOLE** $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ $F_1\left(\sqrt{a^2 + b^2}; 0\right)$ $F_2\left(-\sqrt{a^2 + b^2}; 0\right)$ $e = \frac{\sqrt{a^2 + b^2}}{a}$ **ASINTOTI:** $y = \pm\frac{b}{a}x$
ELLISSE $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ con a>b $F_1\left(\sqrt{a^2 - b^2}; 0\right)$ $F_2\left(-\sqrt{a^2 - b^2}; 0\right)$ $e = \frac{\sqrt{a^2 - b^2}}{a}$	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ con a<b $F_1\left(0; \sqrt{b^2 - a^2}\right)$ $F_2\left(0; -\sqrt{b^2 - a^2}\right)$ $e = \frac{\sqrt{b^2 - a^2}}{b}$

PROPRIETA' LOGARITMI	1. $\log_*(a\cdot b)=\log_* a+\log_* b$ 2. $\log_*(a:b)=\log_* a-\log_* b$	3. $m\cdot\log_* a=\log_* a^m$ 4. $\log_a b=\frac{\log_* b}{\log_* a}$

FORMULE GONIOMETRICHE



ARCHI ASSOCIATI

$$sen\left(\frac{\pi}{2}-\alpha\right)=\cos\alpha$$

$$sen\left(\frac{\pi}{2}+\alpha\right)=\cos\alpha$$

$$sen(\pi-\alpha)=sen\alpha$$

$$sen(\pi+\alpha)=-sen\alpha$$

$$sen\left(\frac{3}{2}\pi-\alpha\right)=-\cos\alpha$$

$$sen\left(\frac{3}{2}\pi+\alpha\right)=-\cos\alpha$$

$$sen(2\pi-\alpha)=-sen\alpha$$

FORMULE di DUPLICAZIONE

$$\cos(2\alpha)=\begin{cases}2\cos^2\alpha-1\\ \cos^2\alpha-sen^2\alpha\\ 1-2sen^2\alpha\end{cases}$$

$$sen(2\alpha)=2sen\alpha\cos\alpha$$

$$tg(2\alpha)=\frac{2tg\alpha}{1-tg^2\alpha}$$

FORMULE di BISEZIONE

$$sen\frac{\alpha}{2}=\pm\sqrt{\frac{1-\cos\alpha}{2}}$$

$$\cos\frac{\alpha}{2}=\pm\sqrt{\frac{1+\cos\alpha}{2}}$$

$$tg\frac{\alpha}{2}=\pm\sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}}$$

FORMULE di ADDIZIONE e SOTTRAZIONE

$$\cos(\alpha\pm\beta)=\cos\alpha\cos\beta\mp sen\alpha sen\beta$$

$$sen(\alpha\pm\beta)=sen\alpha\cos\beta\pm\cos\alpha sen\beta$$

$$tg(\alpha\pm\beta)=\frac{tg\alpha\pm tg\beta}{1\mp tg\alpha tg\beta}$$

FORMULE PARAMETRICHE

$$t=tg\frac{\alpha}{2}\qquad sen\alpha=\frac{2t}{1+t^2}$$

$$\cos\alpha=\frac{1-t^2}{1+t^2}\qquad tg\alpha=\frac{2t}{1-t^2}$$

Radianti	Gradi	Seno	Coseno	Tangente	Cotangente
$\frac{\pi}{12}$	15^o	$\frac{\sqrt{6}-\sqrt{2}}{4}$	$\frac{\sqrt{6}+\sqrt{2}}{4}$	$2-\sqrt{3}$	$2+\sqrt{3}$
$\frac{\pi}{10}$	18^o	$\frac{\sqrt{5}-1}{4}$	$\frac{\sqrt{10+2\sqrt{5}}}{4}$	$\frac{\sqrt{25-10\sqrt{5}}}{5}$	$\sqrt{5+2\sqrt{5}}$
$\frac{\pi}{8}$	$22^o30'$	$\frac{\sqrt{2-\sqrt{2}}}{2}$	$\frac{\sqrt{2+\sqrt{2}}}{2}$	$\sqrt{2}-1$	$\sqrt{2}+1$

LIMITI

LE 7 FORME DI INDECISIONE

1. $+\infty-\infty$
2. $\infty\cdot 0$
3. $\frac{\infty}{\infty}$
4. $\frac{0}{0}$
5. 0^0
6. ∞^0
7. 1^∞

I 7 LIMITI NOTEVOLI

1. $\lim_{x\to 0}\frac{senx}{x}=1$
2. $\lim_{x\to 0}\frac{1-\cos x}{x}=0$
3. $\lim_{x\to 0}\frac{1-\cos x}{x^2}=\frac{1}{2}$
4. $\lim_{x\to +\infty}\left(1+\frac{1}{x}\right)^x=e$
5. $\lim_{x\to 0}\frac{\log_a(1+x)}{x}=\log_a e$

da cui $\lim_{x\to 0}\frac{\ln(1+x)}{x}=1$

6. $\lim_{x\to 0}\frac{a^x-1}{x}=\ln a$

da cui $\lim_{x\to 0}\frac{e^x-1}{x}=1$

7. $\lim_{x\to 0}\frac{(1+x)^k-1}{x}=k$

PUNTI DI DISCONTINUITA'

1. Di prima specie o con salto
2. Di seconda specie e i punti di infinito
3. Di terza specie o eliminabile

DERIVATE

$y=x^n$	$y'=n\cdot x^{n-1}$	$y=senx$	$y'=\cos x$
$y=\sqrt{x}$	$y'=\frac{1}{2\sqrt{x}}$	$y=\cos x$	$y'=-senx$
$y=\log_a x$	$y'=\frac{1}{x}\log_a e$	$y=tgx$	$y'=\frac{1}{\cos^2 x}$
$y=\ln x$	$y'=\frac{1}{x}$	$y=\cot gx$	$y'=-\frac{1}{sen^2 x}$
$y=a^x$	$y'=a^x\cdot\ln a$	$y=arcsenx$	$y'=\frac{1}{\sqrt{1-x^2}}$
$y=e^x$	$y'=e^x$	$y=arctgx$	$y'=\frac{1}{1+x^2}$

$$D\left[f(x)\cdot g(x)\right]=f'(x)\cdot g(x)+f(x)\cdot g'(x)$$

$$D\left[\frac{f(x)}{g(x)}\right]=\frac{f'(x)\cdot g(x)-f(x)\cdot g'(x)}{\left[g(x)\right]^2}$$

INTEGRALI

$\int x^n dx=\frac{x^{n+1}}{n+1}+c$ se n ≠ -1	$\int\frac{1}{\cos^2 x}dx=tgx+c$
$\int\frac{1}{x}dx=\ln\lvert x\rvert+c$	$\int\frac{1}{sen^2 x}dx=-cotgx+c$
$\int e^x dx=e^x+c$	$\int\frac{1}{\sqrt{1-x^2}}dx=arcsenx+c=-\arccos x+c$
$\int a^x dx=\frac{1}{\ln a}\cdot a^x+c$	$\int\frac{1}{1+x^2}dx=arctgx+c$
$\int senxdx=-\cos x+c$	
$\int\cos xdx=senx+c$	