Formule utili

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0.1 Introduction

Here is the text of your introduction.

$$\mathcal{A}\mathring{A}\alpha = \sqrt{\beta} \tag{0.1}$$

0.1.1 Subsection Heading Here

Write your subsection text here.

0.2 Conclusion

Write your conclusion here.

1 Analisi

1.1 Complessi

$$(a+ib)\cdot(c+id) = (ac-bd)+i(ad+bc) \tag{1.1}$$

$$\begin{aligned} \operatorname{Re} z = \frac{z+\bar{z}}{2}, \qquad \operatorname{Im} z = \frac{z-\bar{z}}{2i}, \\ |z| = \sqrt{z\cdot\bar{z}} = \sqrt{x^2+y^2} \end{aligned} \tag{1.2}$$

$$\begin{aligned} z\cdot\bar{z} = |z|^2, \\ \frac{1}{z} = \frac{\bar{z}}{\bar{z}\cdot z} = \frac{\bar{z}}{|z|^2} \end{aligned} \tag{1.3}$$

Teorema 1.1 (proprieta absz)**.** *Il modulo di un numero complesso soddisfa (come il valore assoluto) le seguenti proprietà*

1. $\big||z|\big| = |z|$,
2. $|-z| = |z| = |\bar{z}|$,
3. $|z\cdot w| = |z|\cdot|w|$.
4. $|z+w| \le |z|+|w|$ *(convessità),*
5. $|z-w| \le |z-v|+|v-w|$ *(disuguaglianza triangolare),*

1.1.1 Rappresentazione polare

$$z = \rho u = \rho e^{i\theta}, \qquad \rho = |z|, \quad \theta = \arg z \tag{1.4}$$

1.2 Goniometria

1.2.1 Funzioni

Definizione 1.2 (Funzioni goniometriche)**.**

$$\begin{aligned} \sin(x) = \cos(\frac{\pi}{2}-x) = \frac{1}{\csc(x)} = \frac{e^{ix}-e^{-ix}}{2} \\ = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!} \end{aligned} \tag{1.5}$$

$$\begin{aligned}\cos(x) = \sin(\frac{\pi}{2} - x) = \frac{1}{\sec(x)} = \frac{e^{ix} + e^{-ix}}{2} \\ = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}\end{aligned} \tag{1.6}$$

$$\begin{aligned}\tan(x) = \cot(\frac{\pi}{2} - x) = \frac{e^{ix} - e^{-ix}}{e^{ix} + e^{-ix}} \\ = x + \frac{1}{3}x^3 + \frac{2}{15}x^5 + \frac{17}{315}x^7 + \cdots, \qquad for\ |x| < \frac{\pi}{2}\end{aligned} \tag{1.7}$$

$$\begin{aligned}\csc(x) = \sec(\frac{\pi}{2} - x) = \frac{1}{sin(x)} \\ = x^{-1} + \frac{1}{6}x + \frac{7}{360}x^3 + \frac{31}{15120}x^5 + \cdots, \qquad for\ 0 < |x| < \pi\end{aligned} \tag{1.8}$$

$$\begin{aligned}\sec(x) = \csc(\frac{\pi}{2} - x) = \frac{1}{cos(x)} \\ = 1 + \frac{1}{2}x^2 + \frac{5}{24}x^4 + \frac{61}{720}x^6 + \cdots, \qquad for\ |x| < \frac{\pi}{2}\end{aligned} \tag{1.9}$$

$$\begin{aligned}\cot(x) = \tan(\frac{\pi}{2} - x) = \frac{1}{tan(x)} = \frac{cos(x)}{sin(x)} \\ = x^{-1} - \frac{1}{3}x - \frac{1}{45}x^3 - \frac{2}{945}x^5 - \cdots, \qquad for\ 0 < |x| < \pi\end{aligned} \tag{1.10}$$

Radian	0	$\frac{\pi}{12}$	$\frac{\pi}{8}$	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{3\pi}{8}$	$\frac{5\pi}{12}$	$\frac{\pi}{2}$
Degree	0°	15°	22.5°	30°	45°	60°	67.5°	75°	90°
sin	0	$\frac{\sqrt{6}-\sqrt{2}}{4}$	$\frac{\sqrt{2-\sqrt{2}}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2+\sqrt{2}}}{2}$	$\frac{\sqrt{6}+\sqrt{2}}{4}$	1
cos	1	$\frac{\sqrt{6}+\sqrt{2}}{4}$	$\frac{\sqrt{2+\sqrt{2}}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{2-\sqrt{2}}}{2}$	$\frac{\sqrt{6}-\sqrt{2}}{4}$	0
tan	0	$2-\sqrt{3}$	$\sqrt{2}-1$	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\sqrt{2}+1$	$2+\sqrt{3}$	∞
cot	∞	$2+\sqrt{3}$	$\sqrt{2}+1$	$\sqrt{3}$	1	$\frac{\sqrt{3}}{3}$	$\sqrt{2}-1$	$2-\sqrt{3}$	0
sec	1	$\sqrt{6}-\sqrt{2}$	$\sqrt{2}\sqrt{2-\sqrt{2}}$	$\frac{2\sqrt{3}}{3}$	$\sqrt{2}$	2	$\sqrt{2}\sqrt{2+\sqrt{2}}$	$\sqrt{6}+\sqrt{2}$	∞
csc	∞	$\sqrt{6}+\sqrt{2}$	$\sqrt{2}\sqrt{2+\sqrt{2}}$	2	$\sqrt{2}$	$\frac{2\sqrt{3}}{3}$	$\sqrt{2}\sqrt{2-\sqrt{2}}$	$\sqrt{6}-\sqrt{2}$	1

1.3 Taylor