

Titolo

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26 marzo 2024

Abstract

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1 Environments

1.1 Teoremi, dimostrazioni, proposizioni, lemmi, corollari

```
\begin{The} \lipsum[1] \end{The}
```

Teorema 1.1 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

```
\begin{Proof} \lipsum[1] \end{Proof}
```

Dimostrazione Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et

nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris. \square

```
\begin{Pro} \lipsum[1] \end{Pro}
```

Proposizione 1.1 Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

```
\begin{Le} \lipsum[1] \end{Le}
```

Lemma 1.1 Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consetetuer.

```
\begin{Co} \lipsum[1] \end{Co}
```

Corollario 1.1 Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

1.2 Definizioni, esempi, osservazioni

```
\begin{De} \lipsum[1] \end{De}
```

Definizione 1.1 Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

```
\begin{Exa} \lipsum[1] \end{Exa}
```

Esempio 1.1 Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Donec odio elit, dictum in, hendrerit sit amet, egestas sed, leo. Praesent feugiat sapien aliquet odio. Integer vitae justo. Aliquam vestibulum fringilla lorem. Sed neque lectus, consetetuer at, consetetuer sed, eleifend ac, lectus. Nulla facilisi. Pellentesque eget lectus. Proin eu metus. Sed porttitor. In hac habitasse platea dictumst. Suspendisse eu lectus. Ut mi mi, lacinia sit amet, placerat et, mollis vitae, dui. Sed ante tellus, tristique ut, iaculis eu, malesuada ac, dui. Mauris nibh leo, facilisis non, adipiscing quis, ultrices a, dui.

```
\begin{Oss} \lipsum[1] \end{Oss}
```

Osservazione 1.1 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

1.3 Description, itemize, enumerate

Description

```
\begin{description} \item[Oggetto 1] Prova \item[Oggetto 2] Prova \end{description}
```

Oggetto 1 Prova

Oggetto 2 Prova

```
\begin{itemize} \item Prova \item Prova \item Prova \end{itemize}
```

Itemize

- Prova
- Prova
- Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consetetuer a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consetetuer. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

```
\begin{enumerate} \item[Oggetto 1] Prova \item[Oggetto 2] Prova \end{enumerate}
```

Enumerate

1. Prova
2. Prova

1.4 Note a margine

Lorem ipsum dolor sit amet, consetetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consetetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum. Lorem ipsum dolor sit amet, consetetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consetetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum. Lorem ipsum dolor sit amet, consetetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consetetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum. Lorem ipsum dolor sit amet, consetetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consetetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet

Nota a margine: può essere utile come segnaposto per definizioni, teoremi... Si usa col comando `\note{#1}`

Ho impostato una versione con un colore diverso per spiegare passaggi nelle dimostrazioni. Si usa col comando `\expl{#1}`

tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

1.5 Collegamenti ipertestuali, citazioni, indici, url

Un collegamento ipertestuale si realizza con

```
\label{Label}
```

e si richiama con

```
\ref{LabelTesto}
```

Risultato: [1.5](#)

Una citazione a un libro in bibliografia si realizza con

```
\cite{LabelLibro}
```

Risultato: [\[1\]](#)

Si inserisce un nuovo elemento nell'indice analitico con i comandi

```
\index{Index}
```

```
\index{Index!SecondaVoce}
```

Per il risultato di questi comandi vedere l'indice analitico a fine documento.

Per mettere un link si può usare

```
\url{https://poisson.phc.dm.unipi.it/~puddu}
```

Risultato: <https://poisson.phc.dm.unipi.it/~puddu>

2 Nuovi comandi introdotti in "Custom.sty"

Mathbb (\A)	Mathcal (\AA)	Mathscr (\AAA)	Simboli	
A	\mathcal{A}	\mathscr{A}	<code>\d</code>	d
B	\mathcal{B}	\mathscr{B}	<code>\e</code>	e
C	\mathcal{C}	\mathscr{C}	<code>\exp</code>	\exp
D	\mathcal{D}	\mathscr{D}	<code>\f</code>	f
E	\mathcal{E}	\mathscr{E}	<code>\g</code>	g
F	\mathcal{F}	\mathscr{F}	<code>\i</code>	i
G	\mathcal{G}	\mathscr{G}	<code>\Id{A}</code>	Id_A
H	\mathcal{H}	\mathscr{H}	<code>\j</code>	j
I	\mathcal{I}	\mathscr{I}	<code>\l</code>	l
J	\mathcal{J}	\mathscr{J}	<code>\sbullet</code>	\bullet
K	\mathcal{K}	\mathscr{K}	<code>\v</code>	v
L	\mathcal{L}	\mathscr{L}	<code>\Zero</code>	0
M	\mathcal{M}	\mathscr{M}	Operatori	
N	\mathcal{N}	\mathscr{N}	<code>*</code>	\cdot
O	\mathcal{O}	\mathscr{O}	<code>\CF{A}{B}</code>	$\langle A, B \rangle$
P	\mathcal{P}	\mathscr{P}	<code>\codim{A}{B}</code>	$\text{codim}_B A$
Q	\mathcal{Q}	\mathscr{Q}	<code>\Dif{A}{B}</code>	$d\{A\}_B$
R	\mathcal{R}	\mathscr{R}	<code>\Diff{A}{B}</code>	dA_B
S	\mathcal{S}	\mathscr{S}	<code>\Floor{A}</code>	$\lfloor A \rfloor$
T	\mathcal{T}	\mathscr{T}	<code>\Imm{A}</code>	$\Im(A)$
U	\mathcal{U}	\mathscr{U}	<code>\Leg{A}{B}</code>	$\left(\frac{A}{B}\right)$
V	\mathcal{V}	\mathscr{V}	<code>\nobarfrac{A}{B}</code>	$\frac{A}{B}$
W	\mathcal{W}	\mathscr{W}	<code>\Norma{A}</code>	$\ A\ $
X	\mathcal{X}	\mathscr{X}	<code>\Lie{A}{B}</code>	$[A, B]$
Y	\mathcal{Y}	\mathscr{Y}	<code>\PS{A}{B}</code>	(A, B)
Z	\mathcal{Z}	\mathscr{Z}	<code>\Rad{A}</code>	$\text{Rad}(A)$
			<code>\Re{A}</code>	$\text{Re}(A)$
			<code>\Res{A}{B}</code>	$A _B$
			<code>\Stirling{A}{B}</code>	$\begin{bmatrix} A \\ B \end{bmatrix}$
			<code>\Val{A}{B}</code>	$A _B$

Insiemi e gruppi	
$\backslash\text{Ann}\{A\}$	$\text{Ann}(A)$
$\backslash\text{Aut}\{A\}$	$\text{Aut}(A)$
$\backslash\text{Fix}\{A\}$	$\text{Fix}(A)$
$\backslash\text{GAut}\{A\}$	$\text{Gal}(A)$
$\backslash\text{GL}\{A\}\{B\}$	$\text{GL}(A, B)$
$\backslash\text{GLE}\{A\}$	$\text{GL}(A)$
$\backslash\text{Hom}\{A\}\{B\}\{C\}$	$\text{Hom}_C(A, B)$
$\backslash\text{Im}\{A\}$	$\Im A$
$\backslash\text{Ker}\{A\}$	$\text{Ker } A$
$\backslash\text{OM}\{A\}\{B\}$	$\text{O}(A, B)$
$\backslash\text{Seq}\{A\}\{B\}\{C\}$	$\{A_B\}_{B \in C}$
$\backslash\text{Set}\{A\}$	$\{A\}$
$\backslash\text{SLM}\{A\}\{B\}$	$\text{SL}(A, B)$
$\backslash\text{SO}\{A\}\{B\}$	$\text{SO}(A, B)$
$\backslash\text{Span}\{A\}$	$\text{Span}(A)$
$\backslash\text{SU}\{A\}\{B\}$	$\text{SU}(A, B)$
$\backslash\text{Stab}\{A\}\{B\}$	$\text{Stab}_B A$
$\backslash\text{TM}\{A\}\{B\}$	$\text{T}(A, B)$
$\backslash\text{Tr}\{A\}$	$\text{Tr}(A)$
$\backslash\text{UM}\{A\}\{B\}$	$\text{U}(A, B)$

2.1 Ambienti equazione

$\backslash\text{EqL}\{A\}\{B\}$

Equazione con label

$\backslash\text{Eq}\{A \& B \backslash \backslash C \& D\}$

AB

CD

2.2 Ambienti funzione

$\backslash\text{Map}\{A\}\{B\}\{C\}\{D\}\{E\}$

$A : B \rightarrow C$
 $D \mapsto E$

$\backslash\text{NMap}\{A\}\{B\}\{C\}\{D\}$

$A \rightarrow B$
 $C \mapsto D$

2.3 Ambiente introduzione ai capitoli (ad esempio)

$\backslash\text{begin}\{\text{TitoloIntro}\}[\text{colbacktitle}=\text{red}]\{\text{Titolo}\}\{\text{Riquadro}\}\backslash\text{end}\{\text{TitoloIntro}\}$

Titolo

Riquadro

$\backslash\text{begin}\{\text{RTitoloIntro}\}[\text{colbacktitle}=\text{red}]\{\text{Titolo}\}\{\text{Riquadro}\}\backslash\text{end}\{\text{RTitoloIntro}\}$

Titolo

Riquadro

```
\begin{BoxTitolo}{Titolo}{Riquadro}\end{BoxTitolo}
```

Titolo

Riquadro

2.4 Ambiente minipage

```
\Minipage{A}{B}{C}{D}
```

Pagina a sinistra

Pagina a destra

2.5 Citazione

“A”

B

2.6 Pacchetto "polynomial"

Offre un migliore typesetting dei polinomi (si scrivono solo i coefficienti: la variabile e gli esponenti sono gestiti con le opzioni all'inizio del comando e non si devono scrivere in ogni monomio). Una lista esaustiva di comandi disponibili è la seguente:

```
\polynomial{1,1,2,c,0,0,0,0,5}  
%Lista dei coefficienti di x^0, x^1,x^2 ecc
```

$$1 + x + 2x^2 + cx^3 + 5x^8$$

```
\polynomialfrac{1,1,2,c,0,0,0,0,5}{0,1,1,4}  
%Funzione razionale: elenca i coeff. di numeratore,  
denominatore
```

$$\frac{1 + x + 2x^2 + cx^3 + 5x^8}{x + x^2 + 4x^3}$$

```
\polynomial[falling]{a,b,c,-d,e}
```

$$a + bx^{-1} + cx^{-2} - dx^{-3} + ex^{-4}$$

```
\polynomial[reciprocal]{a,b,c,d,e}
```

$$ax^4 + bx^3 + cx^2 + dx + e$$

```
\polynomial[var=t]{1,1,2,c,0,0,0,0,5}
```

$$1 + t + 2t^2 + ct^3 + 5t^8$$

```
\polynomial[start=1000]{1,1,2,c,0,0,0,0,5}
```

$$x^{1000} + x^{1001} + 2x^{1002} + cx^{1003} + 5x^{1008}$$

```
\polynomial[step=-5]{1,1,2,c,0,0,0,0,5}
```

$$1 + x^{-5} + 2x^{-10} + cx^{-15} + 5x^{-40}$$

```
\polynomial[add=\otimes]{1,1,2,c,0,0,0,0,5}
```

$$1 \otimes x \otimes 2x^2 \otimes cx^3 \otimes 5x^8$$

```
\polynomial[sub=\times]{1,2,-c,0,0,0,0,-5}
```

$$1 + 2x \times cx^2 \times 5x^7$$

2.7 Pacchetto "accents"

Migliora il typesetting di lettere accentate in ambiente matematico. Ad esempio

<code>\undertilde{Prova}</code>	\underline{Prova}
<code>\underaccent{under}{a}</code>	$\underset{under}{a}$
<code>\accentset{over}{a}</code>	$\overset{over}{a}$
<code>\hat{\accentset{\pi}{a}}</code>	$\overset{\hat{\pi}}{a}$
<code>\ring{a}</code>	$\overset{\circ}{a}$
<code>\overrightarrow{Testo}</code>	\overrightarrow{Testo}
<code>\underrightarrow{Testo}</code>	\underrightarrow{Testo}
<code>\xrightarrow[Sotto]{Sopra}</code> %da usare al posto di overset quando c'è un commento sopra/sotto una freccia in una equazione	$\xrightarrow[Sotto]{Sopra}$
<code>\overset{Sopra}{Testo}</code>	$\overset{Sopra}{Testo}$
<code>\underset{Sotto}{Testo}</code>	$\underset{Sotto}{Testo}$
<code>\$\$ \sideset{a^b}{c^d}\sum \$\$</code> %Per mettere accenti vicino a simboli di sum prod bigoplus bigotimes ecc	$\overset{b}{\underset{a}{\sum}}^d$

2.8 Typesetting formule matematiche in \$ \$

`$$\tfrac{Numeratore}{Denominatore}$$`

Testo $\frac{Numeratore}{Denominatore}$ Testo

`$$\tbinom{N}{D}$$`

Testo $\binom{N}{D}$ Testo

3 TikZ e plotting

3.1 Boxes

`\boxed{Prova}`

\boxed{Prova}

`\RiquadroOmbra{Testo}`

Testo

`\begin{TitoloIntro}[colbacktitle=red]{Titolo}{Riquadro}\end{TitoloIntro}`

Titolo

Riquadro

```
\begin{RTitoloIntro}[colbacktitle=red]{Titolo}{Riquadro}\end{RTitoloIntro}
```

Riquadro

Titolo

```
\begin{BoxTitolo}{Titolo}{Riquadro}\end{BoxTitolo}
```

Titolo

Riquadro

3.2 PGF (per info sul typesetting -> "pgfplots" su ctan.org)

Questa sezione contiene solo alcuni esempi: visto che su Overleaf è stata ridotto il tempo di compilazione ho sostituito il codice in verbatim con uno screenshot dell'immagine risultante compilando tale codice

```
\begin{figure}[ht]\centering
\begin{tikzpicture} \begin{axis}[xmin=-0.5, xmax=5, ymin=-0.5,
colorbar sampled, colorbar style={samples=24},
axis equal, xtick=data, ytick=data, grid=major]
\addplot[only marks] coordinates { (4,1) (3,1) (1.5,3) };
\addplot[mesh, domain=0:2.5, tick=\empty] {(x-.5)^2} node [pos=0] {$\bullet$}
node [pos=0.25, pin=0.4:2 ] {$\bullet$}
node [pos=0.5, sloped, xshift=0cm, yshift=-.2cm] {\small Parabola};
\legend{Prova 1, Prova 2};
\end{axis}
\end{tikzpicture}\noindent\hspace{2cm}
\caption{Colormap, legenda, punti e grafici di funzione}
\end{figure}
```

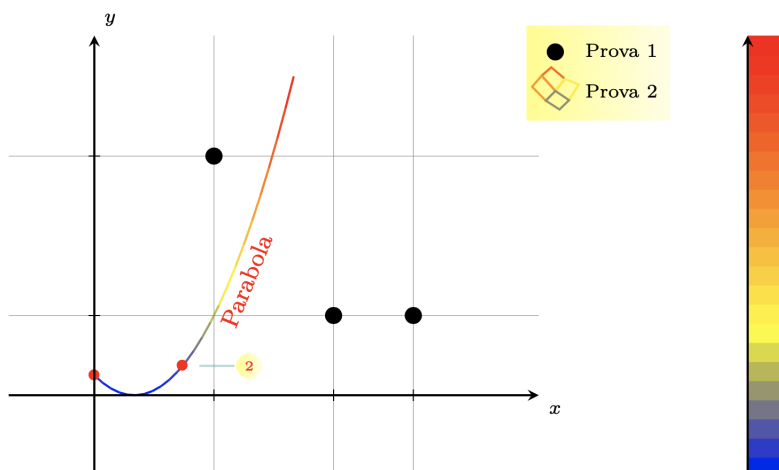


Figura 3.1. Colormap, legenda, punti e grafici di funzione

```
\begin{figure}[ht]\centering
\begin{tikzpicture} \begin{axis}[
  axis equal, xmin=-1.5, xmax=1.5, ymin=-1.5, ymax=1.5]
  \addplot [samples=48, domain=0:2*pi,->,blue, variable=\t,
    quiver={
      u={-sin(deg(t))},
      v={cos(deg(t))},
      scale arrows=0.75,
      colored=red},] ({cos(deg(t))}, {sin(deg(t))});
  \addplot [samples=36, domain=0:2*pi] ( {cos(deg(x))}, {sin(deg(x))} );
\end{axis}
\end{tikzpicture}
\caption{Parametrizzazioni}
\end{figure}
```

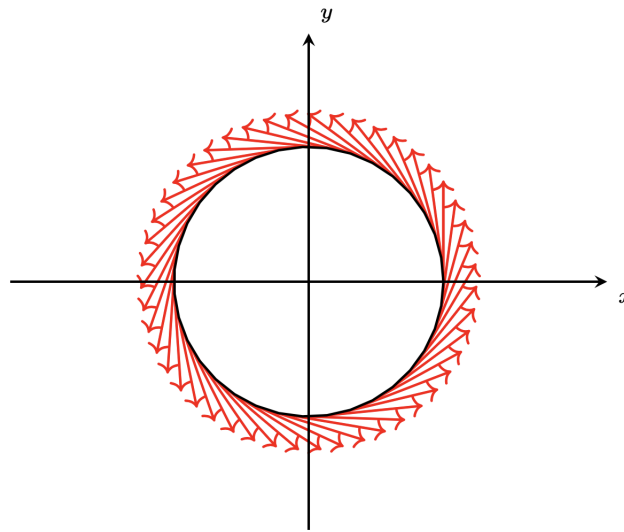


Figura 3.2. Parametrizzazioni

```

\begin{figure}[ht]\centering
\begin{tikzpicture}
\begin{axis}[xmin=-5, xmax=5, ymin=-28, axis equal]
\addplot [samples=24, domain=0:2*pi, dashed, data cs=polar,
top color=Blues-I, bottom color=Blues-B] (deg(x),30);
\addplot [name path=Y, samples=24, domain=0:2*pi, dashed,
data cs=polar] (deg(x),30);
\addplot [GnBu-M, name path=X, domain=0:360, samples=36,
smooth, data cs=polar](x, {30-8*sin(3*x)});
\addplot[green] fill between[of=Y and X];
\addplot [samples=36,domain=0:30, dashed,
data cs=cart] {.025*x^2} node [pos=1] {Nodo};
\addplot [mark=oplus, only marks] coordinates {(0,0)};
\node[pin=120:{Pin nodo}] at (0,0) {};
\end{axis}
\end{tikzpicture}
\caption{Filling, nodi e pin}
\end{figure}

```

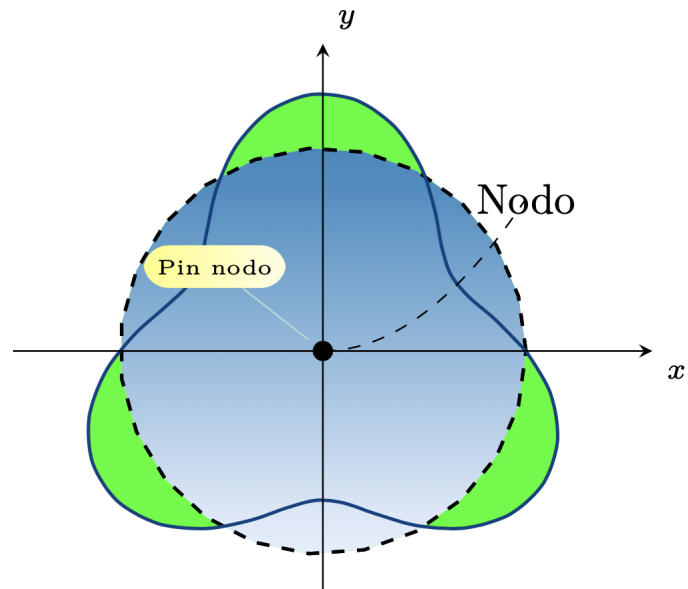


Figura 3.3. Filling, nodi e pin

```
\begin{figure}[ht]\centering
\begin{tikzpicture}[scale=.8]
\begin{axis}[axis equal=false, xmin=-1, xmax=2, ymin=-3.5, ymax=1]
\addplot[red, patch type sampling, patch type= cubic spline, domain=0:2, smooth]{ln(x)};
\draw (0,0) .. controls (1,-1.2) and (1,1) .. (2,1);
\end{axis}
\end{tikzpicture}
\caption{Interpolazione, paths}
\end{figure}
```

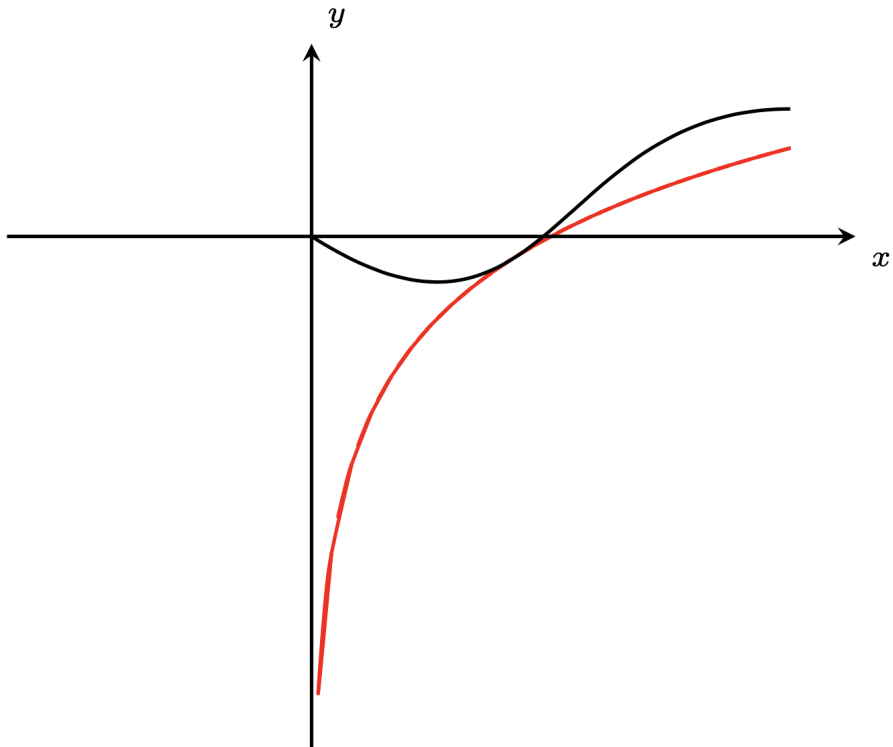


Figura 3.4. Interpolazione, paths

```
\begin{figure}[ht]\centering
\begin{tikzpicture}
\begin{axis}[
  colormap/PuBu,
  samples=12, domain=-5:5, y domain=-4:4, xmin=-5, xmax=5, ymin=-4, ymax=4]
  \addplot3 [surf, samples=24, samples y=40] {x^2+y^2-1};
\end{axis}
\end{tikzpicture}
\caption{Superfici 3D}
\end{figure}
```

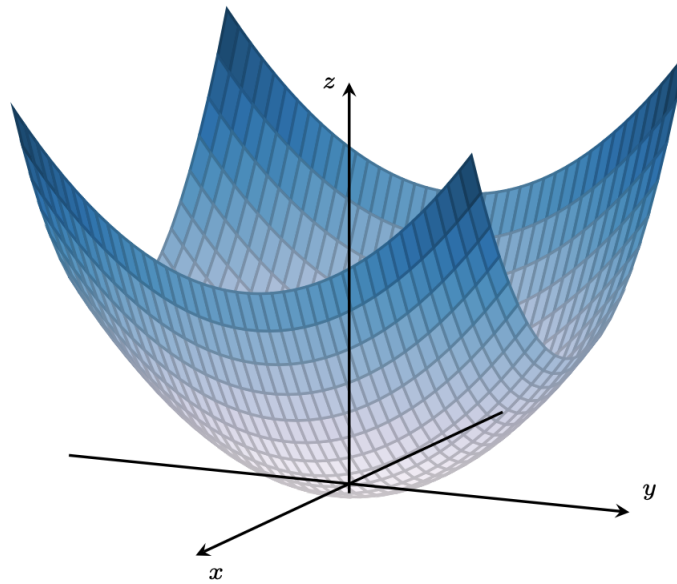


Figura 3.5. Superfici 3D

```
\begin{figure}[ht]\centering
\begin{tikzpicture}[spy using outlines={}]
\begin{axis}[axis equal=false, grid=major, xmin=-1, xmax=6, ymin=0, ymax=1,
every axis plot post/.append style={thick}, xtick=data, ytick=data]
\addplot[line join=round, green] coordinates {(1, 0) (1,.75) (3, 0.9) (4, .75) (5, 0.8)};
\addplot[line join=bevel, blue] coordinates {(0, 0) (1, 0.4) (3, 0.2) (4, 1) (5, 0.9)};
\coordinate (spypoint) at (1,.4);
\coordinate (magnifyglass) at (-2,.25);
\end{axis}
\spy [blue, size=1.5cm, circle, magnification=5, connect spies] on (spypoint) in
node[fill=white] at (magnifyglass);
\end{tikzpicture}
\caption{Ambiente spy}
\end{figure}
```

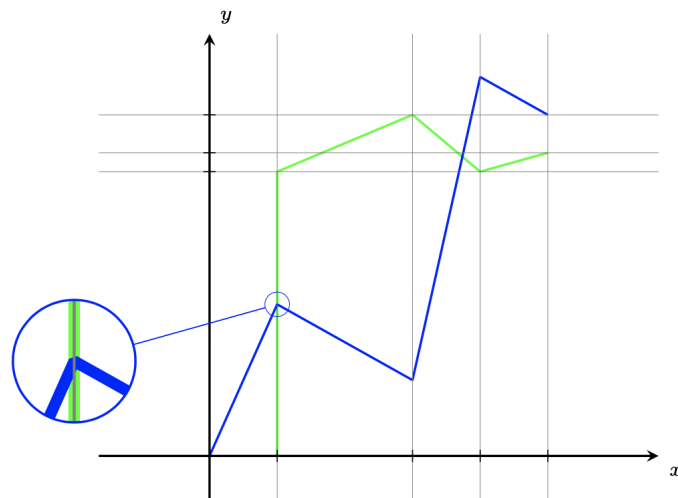


Figura 3.6. Ambiente spy

```
\begin{figure}[ht]\centering
\begin{tikzpicture}[scale=.75]
\begin{axis}[xmin=0, xmax=3.5, ymin=0, ymax=5]
\draw [name path=ellipse] (2,3) ellipse (1.5 and 1.25);
\draw [name path=rectangle] (1.5,1.5) rectangle (3,5);
\fill [red, opacity=0.5, name intersections={of=ellipse and rectangle}]
(intersection-1) circle (2pt) node[above right] {1}
(intersection-2) circle (2pt) node[above left] {2}
(intersection-3) circle (2pt) node[below left] {3}
(intersection-4) circle (2pt) node[below right] {4};
\end{axis}
\end{tikzpicture}
\caption{Intersezione di figure}
\end{figure}
```

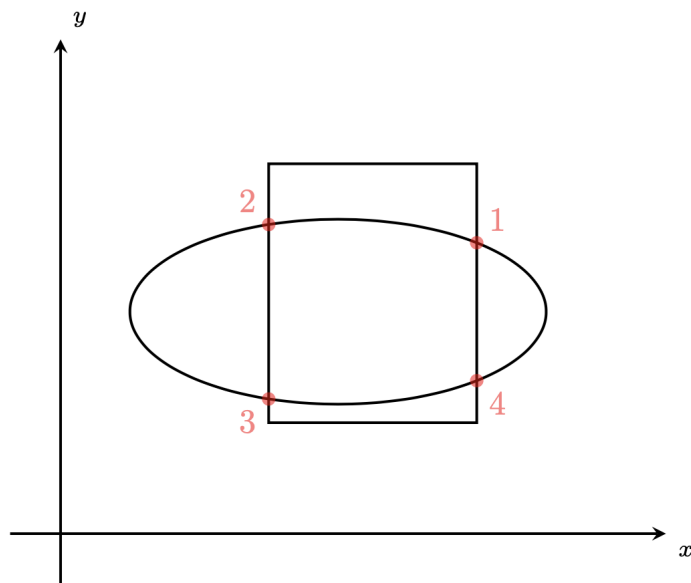


Figura 3.7. Intersezione di figure


```
\begin{figure}[ht]\centering
\tdplotsetmaincoords{70}{135}
\begin{tikzpicture}[scale=3,
tdplot_main_coords]
\tdplotsphericalsurfaceplot[parametricfill]{36}{36}
{\sqrt(15/2)*sin(\tdplottheta)*cos(\tdplottheta)}{black!10}{\tdplotphi}
{\draw[color=black,thick,->] (0,0,0) -- (2,0,0) node[anchor=north east]{$x$};}
{\draw[color=black,thick,->] (0,0,0) -- (0,2,0) node[anchor=north west]{$y$};}
{\draw[color=black,thick,->] (0,0,0) -- (0,0,2) node[anchor=south]{$z$};}
\end{tikzpicture}
\caption{Tikz-3dplot - Esempio 1}
\end{figure}
```

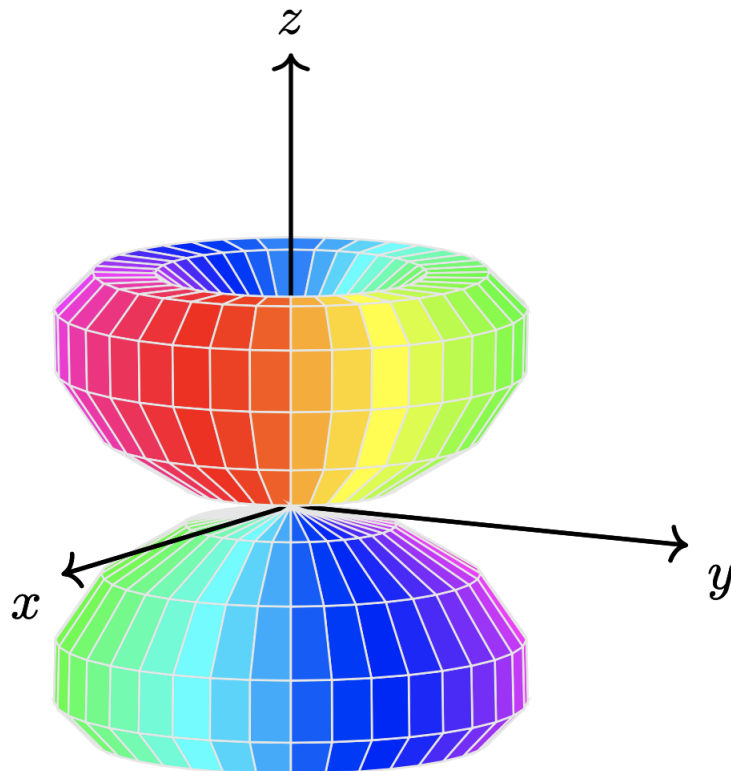


Figura 3.8. Tikz-3dplot - Esempio 1

```

\begin{figure}[ht]\centering
\tdplotsetmaincoords{60}{110}
\begin{tikzpicture}[scale=5,tdplot_main_coords]
\pgfmathsetmacro{\rvec}{.8}
\pgfmathsetmacro{\thetavec}{30}
\pgfmathsetmacro{\phivec}{60}
\coordinate (O) at (0,0,0);
\draw[thick,->] (O) -- (1,0,0) node[anchor=north east]{$x$};
\draw[thick,->] (O) -- (0,1,0) node[anchor=north west]{$y$};
\draw[thick,->] (O) -- (0,0,1) node[anchor=south]{$z$};
\tdplotsetcoord{P}{\rvec}{\thetavec}{\phivec}
\draw[-stealth,color=red] (O) -- (P);
\draw[dashed,color=red] (O) -- (Pxy);
\draw[dashed,color=red] (P) -- (Pxy);
\tdplotdrawarc{(O)}{0.2}{0}{\phivec}{anchor=north}{$\phi$}
\tdplotsetthetaplanecoords{\phivec}
\tdplotdrawarc[tdplot_rotated_coords]{(0,0,0)}{0.5}{0}%
{\thetavec}{anchor=south west}{$\theta$}
\draw[dashed,tdplot_rotated_coords] (\rvec,0,0) arc (0:90:\rvec);
\draw[dashed] (\rvec,0,0) arc (0:90:\rvec);
\tdplotsetrotatedcoords{\phivec}{\thetavec}{0}
\tdplotsetrotatedcoordsorigin{(P)}
\draw[thick,tdplot_rotated_coords,->] (O,0,0)
-- (.5,0,0) node[anchor=north west]{$x'$};
\draw[thick,tdplot_rotated_coords,->] (O,0,0)
-- (0,.5,0) node[anchor=west]{$y'$};
\draw[thick,tdplot_rotated_coords,->] (O,0,0)
-- (0,0,.5) node[anchor=south]{$z'$};
\draw[-stealth,color=blue,tdplot_rotated_coords] (O,0,0) -- (.2,.2,.2);
\draw[dashed,color=blue,tdplot_rotated_coords] (O,0,0) -- (.2,.2,0);
\draw[dashed,color=blue,tdplot_rotated_coords] (.2,.2,0) -- (.2,.2,.2);
\tdplotdrawarc[tdplot_rotated_coords,color=blue]{(0,0,0)}{0.2}{0}%
{45}{anchor=north west,color=black}{$\phi'$}
\tdplotsetrotatedthetaplanecoords{45}
\tdplotdrawarc[tdplot_rotated_coords,color=blue]{(0,0,0)}{0.2}{0}%
{55}{anchor=south west,color=black}{$\theta'$}
\end{tikzpicture}
\caption{Tikz-3dplot - Esempio 2}
\end{figure}

```

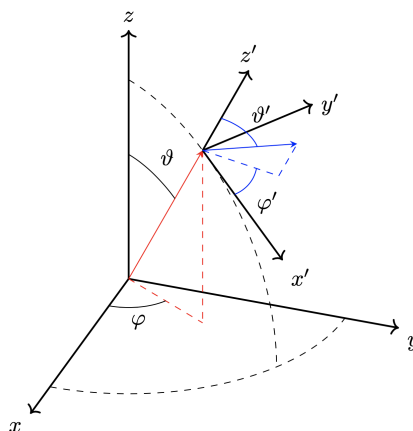


Figura 3.9. Tikz-3dplot - Esempio 2

A Appendice 1

There once was a very smart but sadly blind duck. When it was still a small duckling it was renowned for its good vision. But sadly as the duck grew older it caught a sickness which caused its eyesight to worsen. It became so bad, that the duck couldn't read the notes it once took containing much of inline math just like its favoured equation: $d = u_c \cdot k$. Only displayed equations remained legible so it could still read

$$d = ra^k e.$$

That annoyed the smart duck, as it wasn't able to do its research any longer. It called for its underduckling and said: "Go, find me the best eye ducktor there is. He shall heal me from my disease!"

Riferimenti bibliografici

- [1] 1. Autore and 2. Autore, *Titolo*, Serie, vol. Numero della serie, Publisher, Anno di pubblicazione.
- [2] Autore, *Titolo*, poisson.phc.dm.unipi.it/~puddu