



Apuntes de clase de Cálculo integral

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Tabla de contenidos

I	Primera parte	
1	Primera clase	7
1.1	La antiderivada o integral indefinida	7
1.2	Citas	7
1.3	Listas	7
1.3.1	Observación	7
1.3.2	Bullet Points	7
1.3.3	Descripciones y definiciones	7
2	Segunda clase	9
2.1	Teoremas	9
2.1.1	Several equations	9
2.1.2	Single Line	9
2.2	Definiciones	9
2.3	Notaciones	10
2.4	Remarks	10
2.5	Corolarios	10
2.6	Proposiciones	10
2.6.1	Varias ecuaciones	10
2.6.2	Single Line	10
2.7	Ejemplos	10
2.7.1	Ecuación y texto	11
2.7.2	Párrafo de texto	11

2.8	Ejercicios	11
2.9	Problemas	11
2.10	Vocabulario	11

II

Segunda parte

3	Presentación de la información	15
3.1	Tablas	15
3.2	Figuras	15
	Bibliografía	17
	Libros	17
	Artículos	17



Primera parte

1	Primera clase	7
1.1	La antiderivada o integral indefinida	
1.2	Citas	
1.3	Listas	
2	Segunda clase	9
2.1	Teoremas	
2.2	Definiciones	
2.3	Notaciones	
2.4	Remarks	
2.5	Corolarios	
2.6	Proposiciones	
2.7	Ejemplos	
2.8	Ejercicios	
2.9	Problemas	
2.10	Vocabulario	



1. Primera clase

1.1 La antiderivada o integral indefinida

Definition 1.1.1 — Antiderivada. Sean \mathcal{I} un intervalo, $f: \mathcal{I} \rightarrow \mathbb{R}$ una función y $F: \mathcal{I} \rightarrow \mathbb{R}$ otra función. Se dirá que F es una antiderivada de f si $F'(x) = f(x) \forall x \in \mathcal{I}$.

1.2 Citas

This statement requires citation [**book_key**]; this one is more specific [**article_key**].

1.3 Listas

Lists are useful to present information in a concise and/or ordered way¹.

1.3.1 Observación

1. F es derivable en \mathcal{I} .
2. F es continua en \mathcal{I} .

1.3.2 Bullet Points

- The first item

1.3.3 Descripciones y definiciones

Nombre Descripción

Palabra Definición

Comentario Elaboración

¹Footnote example...

2. Segunda clase

2.1 Teoremas

This is an example of theorems.

2.1.1 Several equations

This is a theorem consisting of several equations.

Theorem 2.1.1 — Nombre del teorema. In $E = \mathbb{R}^n$ all norms are equivalent. It has the properties:

$$|||x|| - ||y||| \leq ||x - y|| \quad (2.1)$$

$$||\sum_{i=1}^n x_i|| \leq \sum_{i=1}^n ||x_i|| \quad \text{where } n \text{ is a finite integer} \quad (2.2)$$

2.1.2 Single Line

This is a theorem consisting of just one line.

Theorem 2.1.2 A set $\mathcal{D}(G)$ is dense in $L^2(G)$, $|\cdot|_0$.

2.2 Definiciones

This is an example of a definition. A definition could be mathematical or it could define a concept.

Definition 2.2.1 — Nombre de la definición. Given a vector space E , a norm on E is an

application, denoted $\|\cdot\|$, E in $\mathbb{R}^+ = [0, +\infty[$ such that:

$$\|\mathbf{x}\| = 0 \Rightarrow \mathbf{x} = \mathbf{0} \quad (2.3)$$

$$\|\lambda \mathbf{x}\| = |\lambda| \cdot \|\mathbf{x}\| \quad (2.4)$$

$$\|\mathbf{x} + \mathbf{y}\| \leq \|\mathbf{x}\| + \|\mathbf{y}\| \quad (2.5)$$

2.3 Notaciones

Notation 2.1. Given an open subset G of \mathbb{R}^n , the set of functions φ are:

1. Bounded support G ;
2. Infinitely differentiable;

a vector space is denoted by $\mathcal{D}(G)$.

2.4 Remarks

This is an example of a remark.



The concepts presented here are now in conventional employment in mathematics. Vector spaces are taken over the field $\mathbb{K} = \mathbb{R}$, however, established properties are easily extended to $\mathbb{K} = \mathbb{C}$.

2.5 Corolarios

This is an example of a corollary.

Corollary 2.5.1 — Nombre del corolario. The concepts presented here are now in conventional employment in mathematics. Vector spaces are taken over the field $\mathbb{K} = \mathbb{R}$, however, established properties are easily extended to $\mathbb{K} = \mathbb{C}$.

2.6 Proposiciones

This is an example of propositions.

2.6.1 Varias ecuaciones

Proposition 2.6.1 — PNombre de la proposición. It has the properties:

$$\left| \|\mathbf{x}\| - \|\mathbf{y}\| \right| \leq \|\mathbf{x} - \mathbf{y}\| \quad (2.6)$$

$$\left\| \sum_{i=1}^n \mathbf{x}_i \right\| \leq \sum_{i=1}^n \|\mathbf{x}_i\| \quad \text{where } n \text{ is a finite integer} \quad (2.7)$$

2.6.2 Single Line

Proposition 2.6.2 Let $f, g \in L^2(G)$; if $\forall \varphi \in \mathcal{D}(G)$, $(f, \varphi)_0 = (g, \varphi)_0$ then $f = g$.

2.7 Ejemplos

This is an example of examples.

2.7.1 Ecuación y texto

■ **Example 2.1** Let $G = \{x \in \mathbb{R}^2 : |x| < 3\}$ and denoted by: $x^0 = (1, 1)$; consider the function:

$$f(x) = \begin{cases} e^{|x|} & \text{si } |x - x^0| \leq 1/2 \\ 0 & \text{si } |x - x^0| > 1/2 \end{cases} \quad (2.8)$$

The function f has bounded support, we can take $A = \{x \in \mathbb{R}^2 : |x - x^0| \leq 1/2 + \varepsilon\}$ for all $\varepsilon \in]0; 5/2 - \sqrt{2}[$. ■

2.7.2 Párrafo de texto

■ **Example 2.2 — Nombre ejemplo.** Aeiou. ■

2.8 Ejercicios

This is an example of an exercise.

Exercise 2.1 This is a good place to ask a question to test learning progress or further cement ideas into students' minds. ■

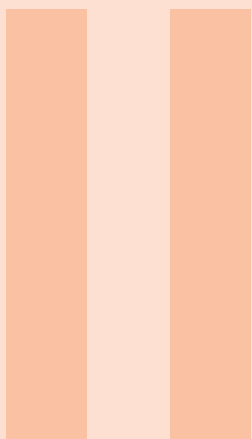
2.9 Problemas

Problem 2.1 What is the average airspeed velocity of an unladen swallow?

2.10 Vocabulario

Define a word to improve a students' vocabulary.

Vocabulary 2.1 — Palabra. Definition of word.



Segunda parte

3	Presentación de la información	15
3.1	Tablas	
3.2	Figuras	
	Bibliografía	17
	Libros	
	Artículos	

3. Presentación de la información

3.1 Tablas

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table 3.1: Table caption

3.2 Figuras

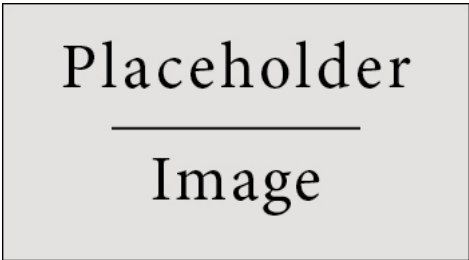


Figure 3.1: Figure caption



Bibliografía

Libros

Artículos

