Apuntes de clase de Cálculo integral

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Tabla de contenidos

Primera parte

1. Primera clase

1.1 La antiderivada o integral indefinida

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

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 way[1].

1.3.1 Observación

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

1.3.2 Bullet Points

- The first item

1.3.3 Descripciones y definiciones

Nombre Descripción
Palabra Definición
Comentario Elaboración

[1] Footnote 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:

$$\big|\,||\mathbf{x}|| - ||\mathbf{y}||\,\big| \leq ||\mathbf{x}-\mathbf{y}|| \tag{2.1}$$

$$||\sum_{i=1}^{n} \mathbf{x}_i|| \leq \sum_{i=1}^{n} ||\mathbf{x}_i|| \quad \text{where } n \text{ is a finite integer} \tag{2.2}$$

2.1.2 Single Line

This is a theorem consisting of just one line.

Theorem 2.1.2 A set $\mathscr{D}(G)$ in 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:

$$||\mathbf{x}|| = 0 \;\Rightarrow\; \mathbf{x} = \mathbf{0} \tag{2.3}$$
$$||\lambda \mathbf{x}|| = |\lambda| \cdot ||\mathbf{x}|| \tag{2.4}$$
$$||\mathbf{x} + \mathbf{y}|| \leq ||\mathbf{x}|| + ||\mathbf{y}|| \tag{2.5}$$

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 $\mathscr{D}(G)$.

2.4 Remarks

This is an example of a remark.

R 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:

$$\big|\,||\mathbf{x}|| - ||\mathbf{y}||\,\big| \leq ||\mathbf{x} - \mathbf{y}|| \tag{2.6}$$
$$||\sum_{i=1}^{n} \mathbf{x}_i|| \leq \sum_{i=1}^{n} ||\mathbf{x}_i|| \quad \text{where } n \text{ is a finite integer} \tag{2.7}$$

2.6.2 Single Line

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

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

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.

II

Segunda parte

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

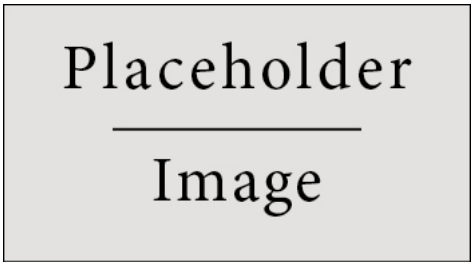

Figure 3.1: Figure caption

Bibliografía