

## Analysis

- We shall differentiate between mathematical physical chemical context of the word analysis
- Analysis – physical (optical context)
- Dissolution of light into its prismatic constituents
- The example 1: A delicate prismatic analysis of white light
- The example 2: The polarization of incident light, and the analysis of the transmitted light.
- Analysis (chemical context) resolution of compound into its proximate components
- The example 1: The quality of charcoal which they yield by analysis.
- The example 2: We obtain sugar and starch by analysis.

## Atomism – sociological context

Example: He repudiated liberal atomism, a doctrine that each individual that all social and political

- The first assignment: Atom The example 1: Atomism is a doctrine that the universe was borne by a fortuitous concourse of atoms economy must start from the individual
- The example 2: By an atom, I mean the ultimate component of the gross body
- The first assignment: Atom: a chemical context The first assignment: Atom: a physical context
- Each atom of oxygen in the water is combined with two atoms of hydrogen. Atoms are endowed with the power of attraction

## Axiom:

We shall differentiate between four mathematical contexts:

**The first:** rule, law – the maximum known as the Golden rule.,

Francis Bacon (empirical rules)

**The second:** proposition: universally negative axioms are those which consist of universally negative particulars

Logic: a self-evident proposition requiring no formal demonstration to prove this.

**The example 1.** Nor are they necessary truths, as mathematical axioms.

**The example2:** The axiom that the whole is greater than the part.

**The example 3:** Happy the youth in Euclid's axioms tried.

## Differential

We shall differentiate between

Mathematical

And physical (astrophysical context)

**Differential-** mathematical context:

**differential 1.** The differential of a real-valued function  $f(x)$ , where  $x$  is a vector, evaluated at a given vector  $c$ , is the linear, real-valued function whose graph is the tangent hyperplane to the graph of  $f(x)$  at  $x = c$ ; if  $x$  is a real number, the usual notation is  $df = f'(c)dx$ .

## differential – physical context

- The differential effect of the Sun is small.
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- The differential motion is a capital discovery in relation to the motion of a glacier.
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- Two tones sounded together and generated the third one, whose vibrational number equals the difference between two vibrational numbers. These tones Helmholtz called: differential tones.

To differentiate

Mathematical context

Biological and mathematical context

**Biological context:** to take different form in the process of growth (OED)

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- **Example 1:** The substance of spermiums becomes differentiated into minute, clear, spherical vesicles
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- **Example 2:** Protoplasm or living jelly which is not yet differentiated into organs
- **The first assignment: differentiate – biological context**

## Contour:

**We shall differentiate between:**

- **Geographical**
- **Mathematical context**

**Geophysical (astronomical context)**

- **definition** – outline of surface
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- **Geographical context:**
- **contour line:** a line representing the horizontal contour of the Earth's surface

- **A contour map:** an elevation laid down on a **contour map** shows the elevations and depressions of the surface.
- **An example 1:** Where the ground is very steep, contour-lines go together
- **An example 2:** Look at the contour map of Europe in Johnston's physical atlas

## Calculus:

- We shall differentiate between

Mathematical

- Biological context

### **Calculus: mathematical context**

The branch of mathematics dealing with differentiation and integration and related topics

- **Calculus: biological context**

**Definition:** A generic term for concretions occurring accidentally in animals

**Renal** (kidney) calculi

**Prostatic (in the prostate)** calculi

**Intestinal** calculi **The example 1:**, a residous intestinal calculus

**The example 2:** Biliary calculi are not infrequently due to this influence

### **CONTINUITY: physics and mathematics**

Continuity principle, continuity equation – we translate it as princip, jednacina kontinuiteta (not neprekidnosti)

The change of the mass of a fluid within a space during continuous flow is the difference between the net mass flow in and out of the space

- The continuity equation expresses the principle during a small interval of time during in terms of fluid density

- **EXISTENCE, EXISTENCE THEOREM** Two mathematical contexts:  
The context of analysis  
  
The context of philosophical logic  
  
Existence – something that exists: a being, an entity  
The enumeration of existences did not escape the attention of the schoolmen  
(John Stuart Mill)
- **The first assignment: existence (mathematical context)**

## Extreme:

- **Extreme, extreme value, extremum** We will disambiguate between two mathematical contexts and astronomical context:
- **Astronomical context:**
- In **spherical geometry**, adjacent paths or the opposite paths

### **Mathematical context:**

- We shall differentiate between two mathematical contexts:

**Mathematical context 1:** extreme and mean ratio

**Mathematical context 2:** In mathematical logic, the subject and predicate of a proposition are called extremes or terms  
**t:**

## Flux:

**We shall differentiate between:**

**Mathematical and physical context:**

**Mathematical context**

## Flux: Astronomical (geophysical) context I

- **Definition:** flowing in of a tide
- **The example 1:** The sea undergoes the flux and reflux as often as the Moon passes the meridian.

**Physical context: flux** The rate of flow of fluid, particles, or energy through a given surface. flux density In radiation, a measure of flux (power per unit area) per wavelength or frequency

interval. The unit of *flux density* is called a Jansky and is defined as  $10^{-23}$  Joule  $s^{-1} m^{-2}$

Hz $^{-1}$  .

**Flux: mathematical context:**

**Definition:** A continued motion of a point

**The example 2:** Not that hereby a line is a flux of a point, as some argue.

Flux: the context of metallurgy:

Any substance that is mixed with metal which facilitates fusion

Iteration

Mathematical, legal and grammatical context

**The first assignment: the word – integrable**

Mathematical

- **The first assignment: integrable – mathematical context**

Philosophical context

**The example:** The expressions are all integrable with respect to one variable

**The example 1:** The lowest living being, the integrable matter, is present everywhere.

- **The example 2:** Dispersed matter of 'integrable matter' .
- **interval The first assignment: interval – musical context**
- **Musical Difference of pitch of sounds between two sounds, either successive (melody) or simultaneous (harmony)**
- **Example: In Greek music, no less intervals are admitted**

### **Mathematical context**

#### **: intermediate**

- Two mathematical contexts

The first context: intermediate – a syzygetic function of two quantities with the same order

- The second context: intermediate - in serial order: intermediate steps through which conclusion is deduced

## • **Iteration**

- **Iteration** – mathematical context: **Iteration - a mathematical context**

- **Iteration** – definition: the repetition of an operation upon its product, as in finding the cube of a cube:

**The example 1:** Iterated integral

**Iteration:** legal context:

**By iteration** he becomes a Roman citizen who, having been made Latin, after he passed the age of thirty, is a new formally manumitted, by a person who had quiritarian in him when a slave

**Iteration:** grammatical context:

**Definition:** Repetition of an action: frequentative

**The example:** Many verbs have no iterative aspect

Mathematical

Astronomical context

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- **Limit superior**

### Limit – astronomical context

Limit of a planet, its greatest heliocentric attitude

Suppose Venus be in the point C in her utmost North Limit

Limit of a planet, its greatest excursions or distances from the Ecliptic

Limit superior – either of the two dates

Earlier of the two dates

LINEAR:

- **LINEAR:**

**Linear – mathematical context:**

linear equation

A linear equation in the variables  $x_1, \dots, x_n$ , and  $y$  is any equation of the form  $a_1x_1 + a_2x_2 + \dots + a_nx_n + y = 0$

### Linear – medical context

Linear extractions of cataract

Linear rectomy

### Linear – botanical context

Two narrowly linear feathers

Linear leaf – one of the two sides of which run parallel against each other

### Linear – physical context (two contexts)

- We shall differentiate between optical and kinematics contexts  
This line is called a diameter, or linear aperture of lenses

The linear magnifying power is the sum of times an object is magnified in length

Linear velocity

- A point p moves in a circle with a constant linear velocity

**Linear – physical context**

## Logarithms

- **Definition:** One of the particular class of arithmetic functions invented by John Napier and tabulated for use as a means of abridging calculation. The word is now understood to refer only to systems in which the logarithm of a number  $ax$  is  $x$ , being a constant, which is called a base of the logarithm

- **We shall differentiate between:**

- Mathematical context

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Physical (kinematic and astronomical context)

**The first assignment: logarithm: mathematical context** This advantage, which the base 10 has over any other, was first seen and applied by Briggs. The logarithms are sometimes called Briggsian.

Bonaparte said that his favourite workbook was a book of logarithms.

Mr Haley has drawn a very curious method of constructing algorithms.

- **Logarithm – physical (kinematic context) context**

A point is said to have a logarithmic motion on a straight line when a distance from a fixed point in line is equally multiplied in equal times

A point from extremity thereof, moving towards a velocity decreasing in a geometric progression, will generate a curve called Logarithmic spiral

**Logarithm – astronomical context**

Constructing logarithmic tables facilitates astronomical calculations.

Logistic logarithms are certain logarithms of sexagesimal number of fractions useful in astronomical calculations.

# Metrics, metric, metrical

## We shall differentiate between:

Mathematical context  
Context of versification

### Mathematical context:

Metric, metrical geometry – opposed to descriptive geometry **The first assignment: Metric, metrical – the context of versification** Pertaining or relating to metre or versification

- **Example:** Most of Euclid's propositions are metrical

## **RADICAL**

Context: chemical, mathematical, astronomical

- Radical – chemical context base of a compound
- **An example:** Oxygen is called a **radical**, or a base of gas. **Radical vinegar** – an old name for acetic acid.

**Radical (astrological and astronomical context)**  
belonging to the radix of astronomical calculation

**Radical (biological context) Belonging to the root of a plant**

**An example:** a radical leaf – that which grows immediately from the

- root of a stalk

**Radical (or radix): mathematical context1** A number or a symbol which is made the basis of a scale of numeration

**An example:** To express a number in the scale whose radix is n.

**An example:** To express a number in the scale whose radix is n.

- **Radical: mathematical context II**

**Radical sign** – radical number

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**Radical** – a quantity forming or expressed as a root of another quantity

**Radical: mathematical context III**

**An example:** A reduction of radical into simpler terms

Used in term relating to the intersection of the curves and planes.

**Radical - mathematical context IV.**

**An example:** the circle of the system x, whose plane passes through the centre of the sphere, is called the radical circle of the system

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**Radical – linguistic context**

A root or a word or a part of a word which cannot be analysed into simpler primitives

**An example:** The Hebrew language consists of fewest radicals.

**The first assignment: signum**

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• Mathematical context

**The first assignment: signum –archaeological context**

• Archaeological context

• The sword was filigreed with particular signa, probably cabalistic charms.

**The first assignment: signum –legal context**

The notary was in use to add signum, which was a flourish of the pen.

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• **SUBSTITUTION**

• **We shall differentiate between:**

Mathematical

Chemical

Biological

Trade- context

**Substitution – mathematical context**

- **The method of integration by substitution** corresponds to the change of the independent variable.
- The method of approximation, which is frequently used and of great importance, **has been obtained by substitution.**
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- **Substitution – Context of biology** –replacement of one organ of function with another, as in many double flowers, where the stamens are replaced by petals,
- **Substitution: musical context** Names given to the two cords of ninth major and minor
- **Substitution: Trade** – dishonest replacement of one article of trade for another  
Several manufacturing firms live on substitution.

Today we shall disambiguate only two words:  
Continuity

### **UNIFORMITY:**

We shall differentiate between>

**Physical  
And mathematical context**

**Uniformity – a physical context** Free from fluctuation or variation  
**Example 1:** The flow of heat from the Sun is held to be uniform Velocity may be uniform, the same at every instant, or may be variable

**Mathematical context:**

**Example 2:** In mathematical topology, uniformity refers to the topological space with uniform structure

**VACUOUS –  
We shall differentiate between  
Mathematical and physical context**

**Mathematical context:**, a vacuous truth is a conditional or universal statement that is true because the antecedent cannot be satisfied.

**vacuous, vacuously**

The water is not able to fill it, hence a **vacuous** space must be formed in the cell

Lucretius contended that thunder or a sound would not be able to pass unless there were **vacuous** spaces in those bodies

Alcohol expands more slowly into aqueous vapour than it would **in vacuum**

- **Variable**
- **We shall differentiate between**

**Mathematical**

**And astrophysical context**

**variable** A symbol which is used to represent some **undetermined** element from a given set, usually the domain of a function

– **mathematical-physical context** a quantity or force, which, throughout mathematical calculation, is assumed to **vary**

We shall differentiate between

**Astrophysical context:**

- Mathematical
- Physical context Star that varies with respect to its brightness and **magnitude**  
The example 1: There are variable stars, the light of which is constantly changing, now becoming more and now less bright
- The example 2: This star appears as a variable star, which shows in a painful succession of light its spots

**Variables (noun) – variable star**

**Variable can denote a variable star: see above.**

- **The example 1:** Among the acknowledged variables, Perseus is perhaps the most interesting

- **The example 2:** The period of this interesting variable is little less than five days