

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 economy must start from the individual universe was borne by a fortuitous concourse of atoms
- 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 $df|_c = f'(c)dx$.

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 calcululi 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 $a_1x_1 + a_2x_2 + \dots + a_nx_n$

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

- 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

- **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

- **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

- 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**

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- **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

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The example 2: This star appears as a variable star, which shows in a painful succession of light its spots

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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

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