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QURANIC-BASED BASIC MATHEMATICS COURSE FOR STUDENTS IN ISLAMIC UNIVERSITIES

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Abstract: At the State Islamic Ministry College (PTKIN), one of the subjects or courses (MK) offered to undergraduate students is basic mathematics. This subject is taught in the first semester to give students the necessary knowledge, skills, or abilities to solve problems. Given the wide range of applications of mathematics, mathematics must be taught in a way connected with religion. The PTKIN document contrasts PTKIN and general universities, which includes this issue. This study aims to provide insights or opinions about the content of the primary mathematics curriculum based on the Al Quran. The author's primary sources for this bibliographic approach are the Al Quran, math articles with an Islamic context, and math publications based on the Al Quran. Other supplementary materials are from articles and math textbooks that are not contextualized within the Islamic framework. One of the various versions that may be utilized as teaching materials for lecturers in this MK is provided in student worksheets and handouts for statistics-related courses.
Keywords: Al-Quran, Basic Mathematics, Integration, Ministry of Islamic Religion Higher Education (PTKIN)

Abstrak: Matematika dasar merupakan salah satu muatan atau mata kuliah (MK) yang terdapat dalam kurikulum sarjana pada perguruan tinggi kementerian Islam Negeri (PTKIN). Muatan ini disajikan pada semester awal agar mahasiswa memperoleh pengetahuan, keterampilan atau skill untuk pemecahan masalah. Ada banyak aktifitas yang menggunakan ilmu matematika, karenanya sangat penting untuk mengajar matematika secara terintegrasi dengan agama. Dimana hal ini merupakan point yang tersurat pada dokumen PTKIN atau distingsi antara perguruan tinggi umum dan PTKIN. Penelitian ini bertujuan untuk memberikan ide atau pemikiran terkait konten-konten materi matematika dasar berbasis Quran. Penulis menggunakan metode kepustakaan yang sumber utamanya adalah Al Quran, artikel-artikel ilmu matematika dengan konteks keislaman, dan buku-buku matematika berbasis Al Quran. Sedangkan sumber penunjang lainnya berasal dari buku-buku matematika dan artikel-artikel lainnya yang tidak terintegrasi dengan konteks keislaman. Ada banyak variasi yang dapat menjadi bahan dosen mengajar pada MK ini, salah satunya seperti yang diberikan pada handout dan lembar kerja mahasiswa untuk topik statistika.
Kata Kunci: Matematika Dasar, Integrasi, Al Quran, Perguruan Tinggi Kementerian Agama Islam (PTKIN).

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INTRODUCTION

Indonesia has the most significant number of Islamic universities in the world. The development of those universities started two centuries ago. At the end of the year 2014, there were 11 State Islamic universities (UIN), 19 State Islamic Institutions (IAIN), 26 State Islamic Schools (STAIN), and 674 Private Islamic Universities (PTAIS). Concerning these numbers, all sections expect this institution to create the scientist and professional graduation (Azra, 2014). Basic mathematics is one of the disciplines studied in the curriculum of Islamic universities (PTAI).

From the study of Basic Mathematics, the subject is expected to deliver a deep understanding of the theoretical concepts in specific cognitive and psychometrics and at least an understanding of the theoretical concepts in general and specific cognitive and psychometrics. The curriculum needs to be arranged toward basic mathematics subjects, especially the content of the materials provided in each study program or discipline. The fact that the Basic Mathematics textbook is available in all disciplines shows that it is used in all disciplines. In comparison, it should be specific and harmonious with each study program/discipline. The availability of textbooks becomes essential to discuss because of the decline in educational quality caused by one factor, namely textbooks. It aligns with one viewpoint, which claims that textbooks are one type of media that can assist the curriculum in accomplishing learning objectives (Widiaty et al., 2019).

Basic mathematics textbooks are available in general form, and the number is also very limited. However, in Islamic University, there are some disciplines in every faculty. Each faculty member has competence relevant to this study program, certainly for institutional subjects, and suitable to the context of each faculty subject. The application is better done in the English Department and Arabic for the Arabic Department. It means that the subject should be matched with learning outcomes and its materials content or materials discussed.

Basic Mathematics is a general subject offered in the first semester with 2 credit hours. The study of Basic Mathematics Subject is linked with Al Quran and is expected to give better meaning transference. Meaningful here means: first, mathematics as general knowledge should not be separated from Islamic knowledge, namely with the Al-Quran Holy Book. Second, the study of basic mathematics is needed in society.

More people are realizing how crucial it is to harmonize scientific ideas with Islamic principles. The universality of the Islamic tenets drawn from the Al-Quran and Hadith is required in many fields. The relationship that exists between science and Islam presents a chance to heal the deep gap between knowledge and faith that has existed between Islam and modern science since the 19th century (Safkolam et al., 2021)

Various research works demonstrate how mathematics and the Islamic setting can be integrated, offering insights or suggestions for further development (Durakovi & Kuri, 2014; Imamuddin et al., 2020; Masamah et al., 2023; Sayoud, 2016; Ulpah & Novikasari, 2020; Yusnita et al., 2016). The goal of the integrated mathematics learning of Islamic values is not to Islamize or create Islamic mathematics; rather, it is an attempt to bring together the ways that Islam and the West see the world and think to make religious people more religious through mathematics, without eliminating the differences between the two sciences (Rahmadhani & Wahyuni, 2020).

Students' critical awareness of the ultimate truth derived from Islamic teachings and values can be developed, as well as their reasoning skills, by incorporating Islamic context into mathematics problems (Kusaeri et al., 2018). The normative goal of integrating Quranic values (Islamic education) into mathematics education is to accomplish Quranic ideals through learning activities that address three student life facets. According to Winarso and Wahid (2020), faith, religion, and noble personality are the first spiritual dimensions. Given that Islam is the predominant religion in Indonesia, it may offer a special and regional perspective. The partition of inheritance, the payment of zakat, and other aspects of worship can all present challenges with Islamic intricacies (Wulan & Astuti, 2022). Arithmetic in *shahadah*, *salah* (Islamic prayers), *zakat*, fasting, and getting ready for the *haj*j (Mariana, 2017). According to Miftah (Miftah et al., 2023), Islamic contexts for mathematical literacy issues often assist pupils in noticing and answering the challenges.

The presentation of institution subjects in the Islamic field in every study program will contribute toward the understanding of general knowledge if the availability of teaching materials, at least in the form of handouts and lembar kerja mahasiswa [students' worksheets] (LKM), which are designed based on Al Quran. Furthermore, it would be better if specific textbooks were available to help obtain the institution.

LITERATURE REVIEW

Quran and Mathematics

Arithmetic is a branch of mathematics that finds application in daily life, including measuring, commerce, and other activities. Regarding all kinds of mathematical computations, numbers are the most crucial idea. Ideas with multiple symbol representations are called numbers. Different systems have arisen with the same meaning in terms of expression. Each system, however, does not preclude the potential for input from other systems to further its development. People utilize various number systems; the Greeks and Romans used similar systems. The numerical notion in mathematics, namely the numbers 1, 2, 3, and 4, is referenced in the Quran. Surah Annisa verse 3 mentions the numbers 5, 6, 7, 8, and 9; Surah An-Namlu verse 48 mentions the number 9, and Surah Al-Kahf verse 25 mentions the number 300. Al Quran Surah An-Naziat verse 30, Al-Shu'ara verse 129, Al-Qasas verse 38, Al-Hadid verse 25, Al-Kahfi verse 31, and Al-Waqiah verse 18 all contain mathematical ideas about shape, form, and geometry. Al-Kahf verse 25, Al-Ankabut verse 14, Al-Hadid verse 18, An-Nisa verse 11, and An-Nisa verse 7 in the Quran contain mathematical ideas about connections (Wan, 2011).

Mathematics, a subfield of theoretical science, examines several facets of the imaginary or mathematical universe. Arithmetic is a subfield of mathematics that focuses on items with a countable component. One advantage of arithmetic is the ability to use money in commercial transactions by understanding its value. Likewise, measuring an object's length is impossible without knowledge of this science. Of course, algebra, which was first invented by al-Khwarizmi and then further developed by Muslim mathematicians, is one of the subfields of arithmetic. Sidqi Al Beik, a Syrian author, tallied the integers in the Holy Quran and reported that there are 285 of them in his book "The Numerical Miracle of the Quran." (Jarrar et al., 1998). Individuals establish a

mathematical relationship through their actions, depending on their intentions. Each individual can establish a relation by acting in a way that impacts one, two, three, four, or all members of the set of all humans. The 32nd verse of the Al-Ma'idah chapter states that when an individual murders an innocent person, they establish a relationship that ultimately elevates them to the status of the killer of the set of all mankind (Barzegari, 2014). According to research done in 2012 by Shaker and Botani (2012), each Quranic chapter's verses, words, and letters were categorized into eight types. Word and letter frequency distributions are similar to one another. As a result, only the probability distributions about the quantity and words have been discovered. These two groupings have exponential and gamma probability distributions, respectively.

Integrating the Quran with Maths

The study and development of mathematics is based on the Quran in this integration. Both explicit and implicit mathematical concepts are included in the Quran. Concerning earlier studies, the following theories can be advanced:

Iranian architecture employs several geometric concepts, including symmetry, the geometric sequence of the rectangle, square, and circle, Iran's golden ratios, modulus, and special numbers (Mohammadi, 2023). Based on reasonably accurate arithmetic calendars that were in use and are still in use in the majority of Islamic countries, the Islamic calendar converter is based on the arithmetical calendar, also known as the tabular calendar, which was introduced by Muslim astronomers in the ninth century CE to predict the approximate beginning of the months in the Islamic lunar calendar (Rashed et al., 2018).

Tauhidic science is a high-level Malay education that prioritizes knowledge construction using the Quran (Che et al., 2017). Islam is known for its integrated and well-balanced culture, in which science and religion coexist together (Tijani, 2016).

RESEARCH METHODOLOGY

Research Design

The research methodology employed in the study was library research, as it was conducted through this means. Certain features serve as a foundation for generating research knowledge, such as researchers only working directly with sources that are already available in libraries or ready-to-use data, as well as secondary data used; research is directly confronted with the data or text presented, rather than with field data or through eyewitnesses in the form of events (Snyder, 2019).

After acquiring multiple publications about fundamental mathematics based on the Quran, we conducted a literature review and descriptive qualitative data analysis. The analysis produced behavioral findings from earlier academic studies and descriptive data in the form of written phrases. According to Miles et al. (2014), there are various stages of reviewing, including data collection, data reduction, data display, and conclusions drawing/verification.

Data Collection

The practice of gathering data in the field from the relevant journals' review procedure is known as data collection. Basic mathematics based on the Quran to get the data required for study.

Data Reduction

A data analysis technique called data reduction looks at, classifies, organizes, and isolates unnecessary data for a conclusive and validated result. Sort journals and usage-related publications into categories. Basic mathematics based on the Quran

Data Display

Findings presentation, pattern analysis for research purposes, conclusion-making, and potential action-taking based on the findings. Secondary data from publications and articles about Quranic-based basic mathematics courses were gathered to draw several broad conclusions from these sources.

Conclusions Drawing/Verification

Concluding fresh results that have never been discovered involves either drawing conclusions or verifying them. The analysis is done to find new information on basic mathematics based on the Quran by drawing broad conclusions that lead to specific conclusions.

FINDINGS AND DISCUSSION

Findings

The field of study explained here consists of the mathematics concept contained in the Al Quran and the Quranic-based mathematics concept for the Islamic university level.

Mathematics Concept Containing in Al Quran

The most important concept in all kinds of mathematics calculation is about numbers. A numeral is an idea that can be represented in some different symbols. Each culture found different systems to describe the same or similar ideas, using different words and language to express similar ideas. However, it will be possible for each system to have contributions from another system in its development.

Mathematics is a discipline closely related to the universe and religion, and the truth of all of that could be in the Al Quran, where there is no direct mention of the word mathematics. Al Quran mentioned the word numerals, form, and connection. Numbers 1, 2, 3, and 4 consist of Annisa Surah verses 3. Numbers 5, 6, 7, and 8 are found in Al Kahfi Surah verse 22, 9 in Al Naml Surah verse 48, and 300 in Al Kahfi Surah verse 25.

Shape or form is a geometric figure that can be defined mathematically; in mathematical terms, shape is known as geometry. A shape is a mathematics object that can be categorized into two parts: plane and space. Al Quran has mentioned the shape concept in An Naziat Surah, verse 30, Al-Shu'ara verse 129, Al Qasas verse 38, Al Hadid verse 25, Al Kahfi verse 31, and Al Waqiah verse 18. One of the geometric shapes found in Al, which is surah, is Glass. Glass is a tool with no handle and is not even a place to have out the water (as it is found in the kettle). At the same time, the kettle has both of them. And that thing is fulfilled with *khamr* from the flowing water, not from containers that will be lost and empty, but from flowing fountains. Glass is a space with three dimensions, namely long, broad, and high (Mahdalena and Nuraini 2021).

Quranic-Based Mathematics Concept

Mathematics is the understanding of numerals, shapes, and connections. The concept of numeral shape and connection is a basic thing that will help develop the next

mathematics. Those three concepts found in the Al Quran have been developed continuously to help face problems in the life of a community, such as in religion, economy, social culture, Information Technology, politics, and other fields. For example, in the problem about *fiqh* in determining the inheritance, it is needed knowledge of mathematics, namely arithmetic in fractions, the percentage to calculate zakat, trigonometry for determining the direction of Qibla, determining one Shawwal, one Ramadhan, and some other topics that used in religion aspects. Observing the available basic mathematics curriculum is still a general one. It means that it needs to be organized about the content materials that will be taught must be suitable to the needs and skills to be a solution to problems that are experienced by society in various aspects. Certainly, Islam is the solution for society, namely the Al Quran. It means that all science built should be based on the Al Quran to achieve its benefits. In this case, basic mathematics should be constructed and organized based on the Al Quran so that it is not wrongly used and improves obedience to Allah *subhanahuwata'ala*.

Besides the Quranic inducement and appreciation of scientific knowledge, there are five main aspects of religious rituals in which mathematics is applied compulsorily (Awan, 2009), they are:

1. The regulation of the lunar calendar (its periods are based on the moon).
2. The regulation of the times of five daily prayers (whose periods are based on the sun).
3. The determination of the sacred direction or direction of Qibla (whose goal is a specific location)
4. The distribution of inheritance (which involves some skills in arithmetic and first-degree algebraic equations).
5. The geometry of Islamic decorative art (which involves various geometrical designs and skills).

This study is important, and the process of science Islamization is important to civilization. In this case, it should be presented with great effort to have teaching materials in the form of handouts that can be used practically in the teaching-learning process. These materials can be modified using modern technology, such as scientific calculators and other computer applications, to help ease the calculation. Based on the observation of some research done, the materials needed are real numbers and an equality linear system. The following is the explanation of the basic mathematics concept of the Quranic based on Islamic University in some materials.

Real Number

The concept of real numbers includes rational and irrational numbers. The delivery of materials can be initiated with the information found in the Al Quran, for example:

Numbers mentioned in the Quran

There are 30 integer numbers mentioned in the Quran at least once. These numbers are tabulated in Table 1. Thirteen out of these thirty numbers are mentioned only once in the Quran, and these are 11, 19, 20, 50,60, 80, 99, 300, 2,000, 3,000, 5,000, 50,000, and 100,000. Note that six of these numbers are prime numbers. There are also eight (8) fractions mentioned in the Quran, and they are 1/10, 1/8, 1/6, 1/5, 1/4,1/3, 1/2, and 2/3. We can also make a table with all the numbers mentioned in the Quran and their ascending values. Table 2 shows all 38 numbers in the Quran (Fazely, 2005).

Table 1. Integer in the Quran in ascending order

Index	Quranic Numbers	Index	Quranic Numbers
1	1	16	40
2	2	17	50
3	3	18	60
4	4	19	70
5	5	20	80
6	6	21	99
7	7	22	100
8	8	23	300
9	9	24	500
10	10	25	1000
11	11	26	2000
12	12	27	5000
13	19	28	10000
14	20	29	50000
15	30	30	100000

Table 2. All numbers in the Quran in ascending order

Index	Quranic Numbers	Index	Quranic Numbers
1	1/10	20	12
2	1/8	21	19
3	1/6	22	20
4	1/5	23	30
5	¼	24	40
6	1/3	25	50
7	½	26	60
8	2/3	27	70
9	1	28	80
10	2	29	99
11	3	30	100
12	4	31	300
13	5	32	500
14	6	33	1000
15	7	34	2000
16	8	35	5000
17	9	36	10000
18	10	37	50000
19	11	38	100000

Relationship Between Oceans and the Dry Land on Earth in the Holy Quran

Roughly, the ratio of oceans to dry land on the surface of the Earth is said to be 75/25; that is, the oceans cover 75% of the face of the Earth. However, after the development of satellite imagery, we now know that this rule of thumb figure is not

precisely accurate. It has been discovered that dry land is precisely 28.8888%, and the remaining 71.1111% area is under water. Let us now turn to the Holy Quran.

In the Holy Quran, the word '*Barr'*, which means 'dry land', is used 13 times, whereas '*bahar*', which means 'ocean', including rivers and lakes, occurs 32 times (total 13 + 32 = 45). There is a remarkable relationship between dry land and underwater areas on Earth. Accordingly, on a percentage basis, the dry land ratio to the Earth's total surface will be 13 divided by 45. Let us calculate 13 / 45 x 100 = 28.8888%. And the percentage of oceans will be 32 / 45 x 100 = 71.1111%.

One is wonderstruck by this exact match with the latest discoveries of science. If anyone thinks that Muhammad (Peace be upon him) was the author of the Holy Quran, then two things are obvious: one, that he was intimately aware of the Earth's geography, and second, that he counted the occurrence of the words Barr and bahar in his book and then adjusted them to match the numbers required for the precise ratio between the dry and watery areas on Earth. Could he perform such an incredible scientific wonder 1,400 years ago? If not, you should eliminate your prejudices and acknowledge that the Holy Quran must be the revelation from Allah, the Creator of the worlds, and that Muhammad (Peace be upon him) is the true Messenger of Allah (Mahmood, 2010).

Problem in Heritance

About inheritance, it was said that one upon a time, three people met Ali bin Abi Thalib Ra. They brought inheritance problems that they experienced, which were difficult to solve. Those three persons had 17 camels as inheritance. They wanted to divide them into allotments: 1/2, 1/3, and 1/9. If they used direct calculation, they each got 8½, 5 2/3, and 1 8/9, which was impossible for the live camels. At that time, Ali bin Abi Thalib Ra suggested they add one more camel by borrowing from them so that the number of camels would be 18. As a result, they got integers, namely 18 camels, so it is easy to do calculations. Thus, each of them brought 9 camels (1/2 part), 6 camels (1/3 part) and 2 camels (1/9 part). The total number of camels remained at 17, and one camel belonged. This phenomenon shows that Ali bin Abi Thalib Ra's mathematical ability was amazing in his time, so it was easy to solve everyday problems using creative and non-conventional methods (Aji, 2014).

The Arithmetic concept was also used or applied in Islamic law in inheritance problems, known as the Islamic law of inheritance. The guideline from Islam is the Al Quran, wherein 35 verses about inheritance were mentioned, known as awaits verses. At least 7 verses refer directly to the death aspect, namely Surah Al-Baqarah verses 180-182 and 240, An-Nisa's verse 33, and Al-Maidah verses 106-107. Only three verses gave specific details of part of the inheritance, namely surah An-Nisa's verses 11, 12, and 176 (Chebet et al., 2014). Referring to the verses of the Al-Quran, the arithmetic concept was used next to solve the inheritance problem. This means that arithmetic became one of the topics used in worship regarding inheritance. It has certainly become the target topic of research and education in Islam. Instead, a journal, A Knowledgebase Model for Islamic Inheritance Information and Knowledge Management, discussed the inheritance process involving Islamic law, arithmetic, and technology.

The Equilibrium Concept in the Quran in Linear Equality System Material

At the beginning of the teaching-learning process, it can be asked the students to discuss about a text, for example:

In the photosynthesis process, plants use energy from the sun to change carbon dioxide (CO_2) and water (H_2O) into glucose ($C_6H_{12}O_6$) and oxygen (O_2).

The equality of chemistry from this reaction is in the form:

$x_1CO_2 + x_2H_2O \rightarrow x_3O_2 + x_4C_6H_{12}O_6$

Atom Carbon $x_1 = ...$

Atom Oxygen: $2x_1 + x_2 = ...$

Atom-Atom Hydrogen $2x_2 = ...$

Obtained system linear homogenous

$$x_1 - 6x_4 = 0$$
$$2x_1 + x_2 - 2x_3 - 6x_4 = 0$$
$$2x_2 - 12x_4 = 0$$

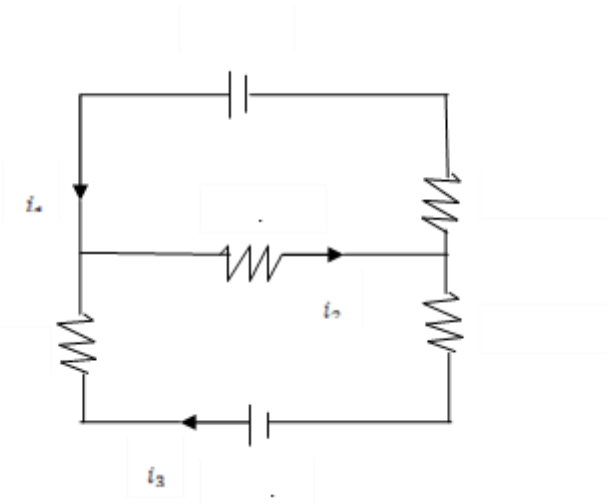
If it is taken $x_4 = 1$, equality will be formed.

$6CO_2 + 6H_2O \rightarrow 6O_2 + C_6H_{12}O_6$

The right and the left space had been balanced. If one atom is overcalculated, it becomes ozone (O3); if a human sniffs it, it can be harmful. But if it is placed in the Earth's atmosphere, it will be very useful in absorbing some of the dangerous ultraviolet light (its radiation) for the creatures on the Earth. This matter was closely related to surah Al-Mulk verses 3 and 4, where Allah created 7 balanced sky layers, and none had a deformity. It also happens in photosynthesis, which consists of an equilibrium concept that can benefit humans; if it happens unbalanced, it will harm humans.

Electricity Network

In an electricity network, we may determine the amount of current in each branch that is stated in resistance and strains. One example of a specific combination is illustrated in the picture below.



Picture 1. Electricity network

The symbols in this picture have the following meanings: wires flowed by electric current, power source, and resistor. The main source of electricity is the battery

(measured in volts), which drives the charge and produces current. This will flow out of the battery terminal, which is drawn by a longer vertical line. Resistance is measured in ohms. The letter code represents the node, and *i* represents the current between the nodes. Amperes in currents. The arrows indicate the direction of the current. However, if one of the currents, for example i_2, turns negative, the current along the branch is in the opposite direction with an arrow.

Kirchhoff's laws are used to determine the current strength:

1. At each node, the sum of the strong currents coming in equals that of those coming out.
2. Around each closed node (loop), the algebraic sum of the voltage must be the same as the algebraic voltage drop.

The reduction in voltage E for each obstruction is given y *Ohm's laws*: $\boldsymbol{E = i\,R}$ where *i* states the current in amperes and R is the resistance in Ohms.

Next, look for currents in the network depicted in the picture above from the first law of Kirchhoff's so that

$i_1 - i_2 + i_3 = 0$ (node A)

$-i_1 + i_2 - i_3 = 0$ (node B)

Based on the second law,

$4i_1 + 2i_2 = 8$ (node up)

$2i_2 + 5i_3 = 9$ (node down)

An enlarged matrix can express the network

$$\left(\begin{array}{ccc|c} 1 & -1 & 1 & 0 \\ -1 & 1 & -1 & 0 \\ 4 & 2 & 0 & 8 \\ 0 & 2 & 5 & 9 \end{array}\right)$$

This matrix can easily be reduced to a row-echelon form.

$$\left(\begin{array}{ccc|c} 1 & -1 & \frac{1}{2} & 0 \\ 0 & 1 & \frac{}{3} & \frac{4}{3} \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 9 \end{array}\right)$$

Completion with reverse substitution will result. $i_1 = 1, i_2 = 2, dan\ i_3 = 1$

It can be learned by discussing Al Quran Surah An-Nur verse 35, which means: Allah (Giver) light (to) heaven and Earth. The parable of God's light is like a hole that is not transparent, in which a large lamp exists. The lamp in the Glass (and) the Glass is like a star (which shines) like a pearl, which is ignited with oil from its blessing tree, (that is) an olive tree that grows not on the east (something) nor on the west (its), whose oil (only) Almost illuminates, even though it is not touched by fire. The light upon light (multi-layered), Allah guides to His light whom He wills, makes parables for man, and knows everything.

Trigonometry for Qibla Direction

The following uses several formulas to calculate the Qibla direction for several cities.

Known:

Lhokseumawe City Longitude = 97 '7' East Longitude

City Latitude Lhokeumawe = 5 '15' 'North Latitude

City of Makkah Longitude = 39 '50 'East Longitude

Latitude Place of City of Makkah = 21 '25 'Northern Latitude

Qibla Direction Formula:

$$\text{Cot B} = \frac{\text{Cot b X Sin a}}{\text{Sin c}} \_ \text{Cos an X Cot c}$$

$$\text{Cot B} = \frac{\text{Cot 68'35' X Sin 84'45'}}{\text{Sin 57'17'}} \_ \text{Cos 84'45' X Cot 57'17'}$$

$$\text{Cot B} = \frac{0.392231316 \text{ X } 0.995804927}{0.841353596} \_ 0.091501618 \text{ X } 0.642399444$$

$$\text{Cot B} = \frac{0.390585877}{0.841353596} \_ 0.058780588$$

Cot B = 0.464235105 - 0.058780588 Cot B = 0.405454517

B = 67' 55' 47' (From North to West)

= 90' – 67'55'47' = 22' 04' 13' (From West to North)

The stages of Qibla Direction Measurement are as follows:

Determine the West and East Direction Signs

(Based on the North and South Directions of Compass)

Determine the distance between A and B along 500 cm

Make a Perpendicular Line at Point B

Determine the CB line with the following calculation:

CB line = AB X Tan 22'04'13'

= 500 X 0,405453735

= 202,7268675 cm

AC line is the direction of the Qibla pointer sought

a = 90' - Place Latitude

90' – 5' 15' = 84' 45'

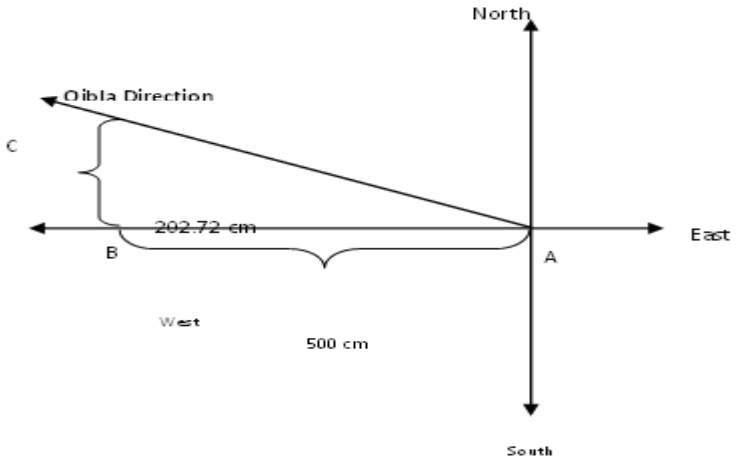
b = 90' - Latitude of Makkah

90' – 21' 25' = 68' 35'

c = Longitude Place – Longitude Makkah

97' 7' - 39' 50' = 57'17'

After calculating based on mathematical formulas, the direction of the city of Lhokseumawe is 67 '55' 47 '(from North to West) or 67'55'47' = 22 '04' 13 '(from West to North). This is as shown below.



Picture 2: Qibla direction of Lhokseumawe city

Creating a framework for teaching mathematics that draws inspiration from the Quran will increase students' interest in the subject, enable them to approach problems more critically, and provide them with a deeper understanding of the subject matter. Activities will also become more meaningful and communicative when the framework is based on the Quran (Lubis et al., 2023).

Example of Students' Worksheet (LKM)

STATISTICS LKM 01

STUDENTS' WORKSHEET

NAME/ CLASS:

ST NUMBER :

MATERIAL: Data Display

A. Learning Objectives

1. Students can find many Quran letters in each chapter.
2. Students can make a graph of the data presented.

B. Material Summary

Data collected for reports and/or subsequent in the next analysis needs to be arranged and presented clearly and well. Generally, two ways of presenting data are often used: tables (or lists) and graphs (or diagrams).

Here, the data presentation that will be discussed is a graphical presentation consisting of line, bar, and pie charts.

C. Instructional Instructions

This section reviews how to make line graphs, bar charts, and pie charts.

Fill in the following table with the number of verses in each letter mentioned.

Table 3. Number of verses in each surah

No.	Number and Name of Surah	Number of Verse
1	[78] An Naba'/ النبإ	
2	[79] An Nazi'at/ النازعات	
3	[80] 'Abasa/ عبس	
4	[81] At Takwir/ التكوير	

5	[82] Al Infithar/ الإنفطار

Line Diagram

1. Make the letter's name as a horizontal axis (X-axis) and the number of verses as a vertical axis (Y-axis) on the coordinate axis.
2. Draw the x and y values into the Cartesian field!

Bar Chart

A Bar Chart is a rectangle whose height represents the frequency of each variable.

1. Put the data on the number of verses placed on the vertical axis (vertical axis) and the category name letter on the horizontal axis (horizontal axis).
2. Make a bar chart.

Pie Chart

A pie chart is a circular diagram presenting data from a category table as a percentage. A pie chart is created by dividing the circle by a percentage scale based on the rate of data that you want to display. Apart from being in the form of percent, pie charts can also be made in a degree scale (following a maximum scale of one circle of 3600).

1. Calculate the percentage of problems presented in the table below

Table 4. Number of verses in each surah

No.	Number and Name of Surah	Number of Verse	Percentage
1	[78] An Naba'/ النبإ	40	40/176x100=22,72 %
2	[79] An Nazi'at/ النازعات	46	
3	[80] 'Abasa/ عبس	42	
4	[81] At Takwir/ التكوير	29	
5	[82] Al Infithar/ الإنفطار	19	
Total		**176**	

2. Divide circles on a percent scale or degree scale (following a maximum scale of one circle of 3600).
   - ✓ 22,72/176x3600=46,490
   - ✓ …….
   - ✓ …….
   - ✓ …….
   - ✓ …….
3. Make a pie chart

Technology

Open the Excel program, create the table above, and select Insert type of pie. To display it, you can insert the number of verses in each section by right-clicking and

selecting the Add data label. For a different color in each section, click the shape, choose the format, and then select the fill shape, pointing out the desirable color.

D. Troubleshooting

Complete the table below in the summation of the surah column and present it in graphical form.

Table 5. Number of surahs in each chapter

Arrangement Of the Holy Quran into Surah and Parts			
Juz No	**Summation Of Suras**	**Juz No**	**Summation Of Suras**
X	Y	X	Y
1	2	16	20
2	2	17	22
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	

CONCLUSION

Mathematics is a name agreed upon by scientists, and the concept is contained in the Quran. The concepts in question are numbers, geometry, and connections. Numbers are mentioned in the Quran: Surah Annisa verse 3, Al-Kahfi verses 22, 25, and Annamlu verse 48. The geometry concept is mentioned in the Quran in the An-Naziat verse 30, Asy Syu'ara verse 129, Al-Qasaas verse 38, Al-Hadid verse 25, Al-Kahfi verse 31, and Al-Waqiah verse 18. The concept of connection is mentioned in the Quran in the Al-Kahfi verse 25, Al-Ankabut verse 14, Al-Hadid verse 18, An-Nisa verse 11, 7. Basic Quranic-based mathematical concepts can be compiled by referring to the verses of the Quran in the context of the material discussed. For example, discussing statistical material with data on the number of letters per chapter produces a curve that follows an exponential function. This is a wonder for those who think and understand mathematics. Of course, this study is very broad and requires further study or research. Much mathematical material is still used for religious rituals, namely the Hijri calendar, prayer times, Qibla direction, inheritance, and geometry for Islamic decoration. Those who are interested in this study can continue in one aspect. The study conducted should be able to produce products in the form of handouts, students' worksheets, written summaries from lecturers, and Quranic-based textbooks for Islamic universities.

These products significantly contribute to achieving instructional objectives—especially for PTKIN. Since this concept has not received much attention in the context of higher education, it is highly recommended that mathematical research be conducted with a focus on the Quran and Islamic principles. One of the study's limitations is its dearth of references and viewpoints on the dichotomy of science, which dampens mathematicians' enthusiasm for documenting this concept. The future advancement of science will undoubtedly be impacted by this, allowing us to investigate and analyze fundamental mathematical ideas derived from the Quran and expanding the corpus of mathematical knowledge.

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