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Learning Integrative Mathematics On The Set Material In The Al-Qur'an Study

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Abstract. This study aims to examine the set in the Qur'an. The study of the site can help both teachers and students in learning. Integrative mathematics learning can improve the set of knowledge integrated with the Qur'an and religious knowledge. The method used in this research is descriptive method to literature study. The results showed that the set in the Qur'an in the QS. Al-Fatihah verse 7, QS. Al-Fatir verse 01, QS. An-Nur verse 45, QS. Thaha verse 06, QS. Al Waqiah verses 07-10, and QS. Al-An'am verse 128.

Keywords. *Learning Integrative; Mathematics; Learning; Al-Qur'an.*

1. INTRODUCTION

The integration of science and religion is needed in education in Indonesia (Mahfudzoh, 2011). The integration aims to improve good morals for students (Abdussakir, 2017a). Mathematics learning also requires integration with religious values (Abdussakir & Rosimanidar, 2017). Integration of mathematics with religion is not only looking for the proposition about mathematics, but to increase students' piety to God.

The integration of mathematics with Islam has been carried out in various campuses under the auspices of the Indonesian Ministry of Religion. One campus that has implemented integration is UIN Maulana Malik Ibrahim Malang. Some lecturers have implemented integration in their learning material (Abdussakir, 2017a, 2017b; Abdussakir & Rosimanidar, 2017). This is different from that in madrasas, the integration of mathematics with religion is still lacking.

The main problem of teachers in integrating mathematics with religion is the incompatibility between learning done with religion, educators and graduates who lack understanding of integration and invalid religious sources (Dwi Maryani, 2014). The solution to this problem is the need for references in the form of books, articles and journals that support the integration of mathematics and the Qur'an and hadith. Because al-Qur'an and hadith are guidelines for Muslims (Abdussakir & Rosimanidar, 2017).

Previous research on mathematics learning integrated with religion included the integration of mathematics and Islam in mathematics learning (Maarif, 2015), the effectiveness of the application of Qur'an mathematics learning in set learning (Gradini, Wahyuni, & Ansor, 2017), and the integrative model of mathematics with the Qur'an and its learning practices (Abdussakir, 2017b). Therefore, it is necessary to integrate al-Qur'an with its set and operations.

The set is a clearly defined collection of objects ("Introduction to Set Theory," 1964). Objects in the set can be numbers, animals, humans, and plants, hereinafter referred to as members of the set (Grayshan, 1982; "Handb. Set Theory," 2010). Certain conditions to distinguish between set members and non-set members who are then called well-defined sets (Yassine, Faddouli, Samir, & Idrissi, 2014). Set operations include slides, joints, complements, and differences (Burn & Gilbert, 2007; Grayshan, 1982; "Introduction to Set Theory," 1964).

The purpose of this study is to examine the collection and operation of collections in the Qur'an which will be integrated in mathematics learning. The hope of this research is that it can be a source of reference for teachers and other researchers to integrate learning with the Qur'an.

2. METHOD

The method used in this research is descriptive with literature study (Sugiono, 2014). Literature study is research that uses literature review, for example, in the form of books, journals, articles and from previous studies (Creswell, 2015; Moleong, 2017). The literature in this study is to examine the verses of the Qur'an relating to sets and operations of the set.

3. RESULTS & DISCUSSION

1. Definition of a set

1.1 The concept of the set

The set is an important and fundamental part of mathematics. Simply put, a set that is a collection of objects or objects. The collection of objects or objects must meet certain requirements in order to be called a set.

1.2 The concept of the set in the Qur'an

The Word of Allah SWT in the Qur'an, Al-Fatihah verse 7:

صِرَاطَ الَّذِينَ أَنْعَمْتَ عَلَيْهِمْ غَيْرِ الْمَغْضُوبِ عَلَيْهِمْ وَلَا الضَّالِّينَ ٧

It means: "(That is) the way of those whom You have given favor to them; not (the road) of those who are wrathful and not (also on the way) of those who have gone astray "

1.3 Interpretation of the Qur'an Surah Al-Fatihah verse 7

Jalaluddin al-Mahalli and Jalaluddin as-Suyuthi in the interpretation of Jalalain explained that (the path of those whom You have bestowed upon them), namely through Your guidance and guidance. Then the meaning is clarified again by the following verse: (Not the way) those who are worth) What is meant is the Jews. (And neither) and besides (those who are heretics) are meant Christians. The benefit of this explanation is that it is Jews and not Christians. Only Allah is All-Knowing and only Him is returned everything. May his blessings and greetings be extended to our lord Prophet Muhammad and his family and friends, blessings and many greetings forever. It is enough for us God as a helper and He is the best helper. There is no power and no strength, but only thanks to the help of Allah, the Most High, the Most Great.

1.4 Linkages between Letters and Concepts

Based on the explanation above if drawn into the concept of a mathematical set, then it is divided into three groups, namely: 1) groups that get favor from Allah SWT; 2) the group that received the curse; and 3) heretical groups.

2. Set Relations

2.1 The Concept of Set Relations

The relation of the set is the comparison between sets which are usually done based on certain rules. In the context of a set, there are two relations, namely the relation "subsets" and relations "equal". Symbolically, the two relations are respectively denoted by \subseteq and $=$.

2.2 Relationship of the Set in the Qur'an

The Word of Allah in the Qur'an, Al-Fatir verse 1

الْحَمْدُ لِلَّهِ فَاطِرِ السَّمَوَاتِ وَالْأَرْضِ جَاعِلِ الْمَلَائِكَةِ رُسُلًا أُولِي أجنحةٍ مثنى وثلاث ورباع يزيد في الخلق ما يشاء إن الله على كل شيء قدير ١

It means: "Praise be to Allah, the Creator of heaven and earth, Who makes angels as messengers (to take care of various kinds of affairs) who have wings, each (there are) two, three and four. God adds to His creation what He wants. Surely Allah has power over all things.

2.3 Interpretation of the Qur'an, Surah Al-Fatir verse 1

Surah Al-Fatir verse 1 is interpreted by the interpretations of Quraish Shihab and Jalalain, namely this letter opens by praising Allah Almighty for creating the heavens and the earth without prior examples and making angels who have various wings as apostles to His servant. As the information that has been mentioned in the beginning of the letter As-Saba (Creator of heaven and earth) who created both without the concept first (which makes angels as messengers) to the prophets (who have each wing there are two, three, and four Allah added to His creation, that is, to create angels and others (what He wants. Indeed, Allah is All-Powerful over everything).

2.4 The Linkage of Letters to the Concept of Set Relations

Based on the explanation above if drawn into the relations of the set, if A is the set of angels as messengers of God and B is the set of angels who have wings 2,3, and 4, then it is found that the members of the set B are nothing but members of the set A on the condition of set B is an angel. In detail will be explained through the following example.

$A = \{\text{set of angels}\}$

$B = \{\text{angels who have wings 2,3 and 4}\}$

This description leads to the concept of a set in a set called a subset or \subseteq . Or you can write $B \subseteq A$.

3. Operations Set

Operations on a set, include joint operations (union), intersection (intersection), complement, and Curtis multiplication (Abdussakir, 2014).

3.1 Union (\cup)

3.1.1 Union Concepts (\cup)

The union (union) of the sets A and B is the set whose each member is a member of the set A or the set B . Notated with $A \cup B = \{x \mid x \in A \text{ or } x \in B\}$.

For example

$A = \{\text{letter of iqlab}\}$

$B = \{\text{letter of idham bilaghunnah}\}$

Then, $A \cup B = \{ba', lam, ra\}$.

3.1.2 Union concepts in the Qur'an

The Word of Allah in the Qur'an An-Nuur verse 45:

وَاللَّهُ خَلَقَ كُلَّ بَاطِنَةٍ وَمِنْهُمْ مَنْ يَمْشِي عَلَى رِجْلَيْنِ وَمِنْهُمْ مَنْ يَمْشِي دَابَّةً مِنْ مَاءٍ فَمِنْهُمْ مَنْ يَمْشِي عَلَى أَرْبَعٍ يَخْلُقُ اللَّهُ مَا يَشَاءُ إِنَّ اللَّهَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ ٤٥

Surat A-Nuur verse 45 according to the Quraish Shihab Tafsir namely Allah is the creator of all things by his will. He created all kinds of animals from the same origin namely water. Then not one animal that does not need water. Then made into animals that vary in terms of species, potential, and other differences. So some of the animals walk on their stomachs like fish and other crawling animals. Others walk on both feet like humans and birds. There are also types of animals that walk on four legs like animals. Allah created the creatures He desired by any means to show His power and knowledge. He is the One Who wishes to choose and is Almighty over all things.

3.1.3 The Correlation of Letters to the Combined Concept

Based on the explanation above if drawn into a set operation, if A is a set of two-legged animals, namely chickens, ducks, and geese and B is a set of four-legged animals, namely cows, goats, and buffalo, then it is found that $A \cup B = B \cup A$ or it can be symbolically written $A \cup B = \{x \mid x \in A \text{ or } x \in B\}$. The word "or" means that x is contained in A only, B only or in A all at once B . More detailed is exemplified as follows:

Then obtained: $A \cup B = \{\text{Chicken, duck, goose, goat, buffalo, cow}\}$

3.2 Sliced (\cap)

3.2.1 Definition of Sliced (\cap)

The intersection of the sets A and B is the set whose each element is an element of the set A and the set B . Notated by: $A \cap B = \{x \mid x \in A \text{ and } x \in B\}$.

For example:

$A = \{\text{10 last surah order in the Qur'an}\}$

$B = \{\text{Letter in juz 30 which has verse number 5}\}$

Then $A \cap B = \{\text{Al - falaq, Al - lahab, Al - fil}\}$.

3.2.2 The concept of Sliced in the Qur'an

The Word of Allah in the Qur'an verse 6:

لَهُ مَا فِي السَّمُوتِ وَمَا فِي الْأَرْضِ وَمَا بَيْنَهُمَا وَمَا تَحْتَ الثَّرَىٰ ٦

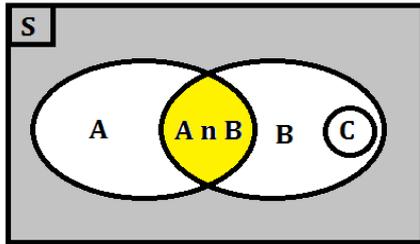
It means: "His is all that is in the heavens, all that is on earth, all that is between them and all that is underground".

3.2.3 Tafsir Qur'an letter Thaha verse 06

Surah Thaha verse 06 according to Tafsir Jalalain namely (belongs to all that is in the heavens, all that is on earth, all that is in between them) is that the creatures that exist between the two (and all that are under the ground) that is the layer wet soil, what is meant is under all seven layers of the earth, because the seven layers of the earth are under the wet layer of soil.

3.2.4 The Linkage of Letters to the Sliced Concept

Based on the At-Thaha verse, verse 06, we can define the concept of slices by drawing a Venn diagram as follows



Information:

$A = \{ \text{Objects in the sky} \}$

$B = \{ \text{Objects on earth} \}$

$C = \{ \text{Objects in the bowels of the earth} \}$

$A \cap B =$

$\{ \text{Objects that exist between heaven and earth (oxygen, water, temperature, light, meteor)} \}$

The Venn diagram depicted in the above verse is a universal set with a combination of the set A (objects in the sky) and the set B (objects on earth). $A \cap B =$ objects that exist between heaven and earth and the set C (objects in the bowels of the earth).

The value of the creed in the above verse is to strengthen the evidence of Tauhid Rububiyah (believing that God is the only One who created and governed the universe). God has created the universe and everything in its entirety. The creation of God is one proof of the existence of God as the only Essence that is both (existent) and the Almighty. Celestial bodies, earth objects, objects that are between heaven and earth and objects in the bowels of the earth, all that could not have existed if nobody created.

3.3 Complement

3.3.1 Definition of Complement

Complement of a set A to a set of universes U is a set whose elements is U elements which are not elements A . Notated by: $A^c = \{x \mid x \in U, \text{ but } x \notin A\}$. Suppose $U = \{0, \dots, 11\}$ and $A = \{1,3,5,7\}$ then, $A^c = \{0,2,4,6,8,9,10,11\}$.

3.3.2 Complement in the Qur'an

The Word of Allah SWT in Al-Qur'an Surah Al-Waqiah verses 07-10, namely:

وَكُنْتُمْ أَزْوَاجًا ثَلَاثَةً ۚ فَأَصْحَابُ الْمَيْمَنَةِ مَا أَصْحَابُ الْمَيْمَنَةِ ۗ وَأَصْحَابُ الْمَشْأَمَةِ مَا أَصْحَابُ الْمَشْأَمَةِ ۚ وَالسَّفِيرُونَ الْأَسْفِرُونَ ۙ

Meaning: "And you become three groups. Namely the right group. How noble the right group is. And the left. How miserable the left group. And those who believe first".

3.3.3 Interpretation of the Qur'an, Surah Al-Waqiah verses 07-10

Surah Al-Waqiah verses 07-10 according to Tafsir Jalalain namely (And you become) on the Day of Judgment (grouped) consists of groups (which are divided into three), (namely the right group) they are the people who record books the deeds of their deeds are given to him from the right, (And the left) those who give the book of charity given to him from the left (what a misery the left) is this expression which insults their position, because they are put into hell, and (And the people who were the earliest) in goodness, they were prophets; This verse has the status of being a preacher (i.e. those who are the earliest) This verse reconfirms the meaning of the first verse, intended as an expression of the greatness of their position.

3.3.4 The Correlation of Letters to the Complement

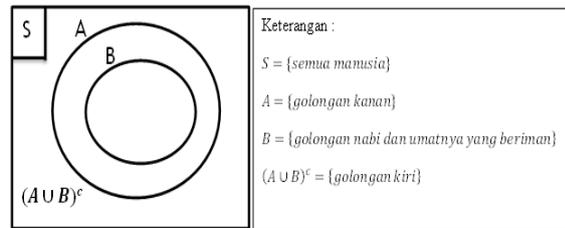
Concept In Surah Al-Waqiah which tells about the Day of Resurrection even Allah shows that there are 3 sets there, namely:

The right group, that is the noble group who received

the book of charity with the right hand in it are Muslims who believe and do good deeds. 2. Then the second is the left group, that is the miserable group, they receive the notebooks of their charity with their left hand, they are the losers

And the last group is the group of people who believe first, they are the people who obeyed the people of the previous prophets before the prophet Muhammad. Then there is also a small group of people who are then believers and believers of the prophet Muhammad.

In mathematical science, we can describe both groups in the Venn diagram as below:



From the Venn diagram above it is known that in the right class contains the group of prophets and believers, meaning the group of prophets and their believers are a subset of the right group. While the left group is in addition to the right group and the group of prophets and believers, therefore the left group is called the complement of the right group and the group of prophets and believers.

4. Mutual Set

4.1 The Concept of Mutual Assemblies

Disjoint sets are two sets A and B that do not have the same elements. Notated with: $A // B$ Example: if $A = \{\text{letter of the letter}\}$ and $B = \{\text{letter of idham bigunnah}\}$ then $A // B$ because the set elements A and set elements B are not the same.

4.2 The Concept of Mutual Assemblies in the Qur'an

The Word of Allah SWT in the Qur'an, Al-An'Aam verse 128:

وَيَوْمَ يَحْشُرُهُمْ جَمِيعًا بِمَعْسَرِ الْجِنَّ فِدِ اسْتَكْبَرْتُمْ مِنَ الْإِنْسِ وَقَالَ أَوْلِيَاؤُهُمْ مِنَ الْإِنْسِ رَبَّنَا اسْتَمْتَعَ بَعْضُنَا بِبَعْضٍ وَبَلَّغْنَا أَجَلَنَا الَّذِي أَجَلْتَ لَنَا قَالَ النَّارُ مَثْوَاكُمْ خَالِدِينَ فِيهَا إِلَّا مَا شَاءَ اللَّهُ إِنَّ رَبَّكَ حَكِيمٌ عَلِيمٌ ١٢٨

It means: "And (remember) the day when Allah gathered all of them (and Allah said):" O jinn, verify you have deceived many people ", then said comrades from the group of men." O our Lord, actually a part of we have had the pleasure of some (another) and we have arrived at the time that You have set for us ". Allah says: "Hell is your dwelling place, while you abide in it, unless Allah wills (the others)". Verily, your Lord is Wise, Omniscient ”.

4.3 Description of Asbabun Nuzul And Tafsir Surat Al An'am verse 128

Allah S.W.T said, (و) "And", Remember, O Muhammad, about what you are telling and warning them. (جَمِيعًا يَحْشُرُهُمْ يَوْمَ) "The day when Allah gathered them all" Namely the jinn and their friends from among the human race who worship them (jinn) in the world, asking for their protection, obeying them, and some of them whispering to some of them in the human race who worshiped them (jinn) in the world, other beautiful words deceive.

(الْإِنْسِ مِّنْ اسْتَكْبَرْتُمْ فِدِ الْجِنَّ بِمَعْسَرِ) ("O jinns [shaytan], indeed you have many [misleading] humans." not that) (الْإِنْسِ مِّنْ اسْتَكْبَرْتُمْ فِدِ) "in fact you have many (mislead) humans. "Meaning, it has distorted and misled them a lot. As in the word of Allah SWT in the letter Yaasiin verses 60-62:

﴿أَلَمْ أَعْهَدْ إِلَيْكُمْ يَا آدَمُ أَنْ لَا تَعْبُدُوا الشَّيْطَانَ إِنَّهُ لَكُمْ عَدُوٌّ مُّبِينٌ ٦٠ وَأَنْ أَعْبُدُونِي هَذَا صِرَاطٌ مُسْتَقِيمٌ ٦١ وَلَقَدْ أَضَلَّ مِنْكُمْ جِبِلًّا كَثِيرًا أَفَلَمْ تَكُونُوا تَعْقِلُونَ ٦٢﴾

Meaning: Did I not command you, Banu Adam so that you will not worship Shaitan? Surely Satan is your real enemy. And you shall worship Me. This is the straight path. Surely the devil has misled most of you, then do you not think? His Word, (بِيعَضَ بَعْضُنَا اسْتَمْتَعَ رَبَّنَا مِنَ الْإِنْسِ مِّنْ أَوْلِيَاؤُهُمْ وَقَالَ) "then said their friends from the humanitarian group:" Yes Rabb we mean, some of us actually, some of our enjoyment, "we have part of the pleasure", we have part of the fun " jinn from among mankind said with this (sentence) as an answer to Allah for His word. Regarding this verse, Ibn Abi Hatim said from al-Hasan,

"Allah said, 'you have gained a lot to inhabit Hell on the Day of Resurrection,' Then the friends of the jinn from among human beings said, (بِيعَضَ بَعْضُنَا اسْتَمْتَعَ رَبَّنَا) the other). "And the meaning is none other, that the genie was ordered, and the humans obey". Regarding His word (بِيعَضَ بَعْضُنَا اسْتَمْتَعَ رَبَّنَا). "Yes, our Rabb, in fact, some of us have had the pleasure of some (others). "Muhammad Ibn Ka'ab said:" that is (as) a friend in the world. "And His word (لَنَا أَجَلْتُ الَّذِي أَجَلْنَا وَبَلَّغْنَا) " And we have come to the time that You have set for us. "As-Suddi said:" (that is) death. "(مَثْوَاكُمْ النَّارُ قَالَ)" Allah says: 'Hell is your dwelling place.'

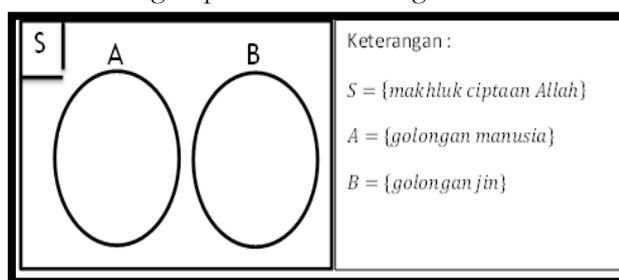
As for the interpretation of the Qur'an letter Al An'am by Jalalain namely (Dan) remember (the day when we gathered them all) by using nun and yes; it means that Allah has gathered all creatures and then called upon them ("O genie / devil! Surely you have deceived many people") by way of misleading them (then told their friends), those who want to obey it (from humans, " O our Lord, in fact, some of us have had the pleasure of some others) humans have benefited through the jinn who adorn their lusty desires, and likewise the jinn also benefited from humans through human obedience to them (and we have arrived to the time that

You have set for us) which is the Day of Judgment; this is an expression of their disappointment (Allah says) Most High God, to them through the mouth of His angels (Hell is your place) where you dwell (whereas you are eternal in it, unless Allah wants others) certain time limits where they can be expelled from hell, to drink home / sweat of hell experts who are outside of hell, thus as what was said in his words, "Then verily their place of return is really to hell wombs".

And it has been narrated from Ibn Abbas that this verse was revealed with regard to those whom Allah knows that they are believers. This means Lafal me means man. (Indeed, God is Wise) in arranging His creation (again, knowing) about His creatures.

4.4 The Correlation of Letters in Relationships

In that verse, Allah brings together two groups, namely the jinn and the human group. The genie is a group of creatures created by God that cannot be seen by humans, but the genie can see humans. Jinns were created by Allah before the prophet Adam was created and Allah created the jinn from very hot fire. While the human group is God's creature created from clay and Adam was the first human being created by God. In mathematical science, we can describe both groups in the Venn diagram as below:



In the concept of the group of jinn and humans is a set of mutually loose with the universe a creature created by God.

4. CONCLUSION

Based on the discussion that in the Qur'an there are collections and set operations including QS. Al-Fatihah verse 7, QS. Al-Fatir verse 01, QS. An-Nur verse 45, QS. Thaha verse 06, QS. Al-Waqiah verses 07-10, and QS. Al-An'am verse 128.

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