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Mathematics at Ali Bin Abi Talib (AS) (MK-Ali Series)

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Abstract: Praise be to God. The rest and the other does not last. Lift the sky and adorn it with stars. And he grabbed the earth with mountains in the border. He created these objects with his power. Then her death and erased objects. Then blow into the trumpet and if the dead is done. A team went to Dar Al-Nuaim and a team into a fire. Praise be to God who had LAH what happened pen. He did not speak the tongue. And peace and blessings be upon our Prophet Muhammad and the Messengers of the pious on the God of the good and virtuous. Praise be to Allah Who has enlightened our minds. And easy our way. And fill our time with benefit us. We praise God and thank him that made us a nation. Ali Bin Abi Talib is the cousin of the Prophet of Islam Muhammad Bin Abdullah and the husband of his daughter Fatima. This man was distinguished from other Muslims in particular not characterized by others. Such as courage, eloquence, strength, wisdom and intelligence. And other good characteristics which did not meet only Mohammed Nabi Islam and this man (Ali Ibn Abi Talib) has witnessed him, so, all the Muslims who have experienced him, the most prominent caliphs who preceded him in the succession of Muslims. Here, in this our research we do not want to touch upon all the virtues of this man because it does not suffice dozens of volumes and hundreds of scientific researches to cover part of his foresight. We will devote this research to the study and analysis of mathematical style and mathematical simulation which was used by Ali Bin Abi Talib in solving the issue presented to him. We scientifically prove the accuracy of his judgment where we will touch on a sporting event occurred with Ali Bin Abi Talib to know how this man was thinking and how he had a mind that never repeated after him. This case is called the cumulative distribution of quotas. We will analyze this issue mathematically as follows.

Key words: Ali Bin Abi Talib, heir, camel, cumulative shares, MK-Ali series, MK-Ali sequence, experienced

INTRODUCTION

Ali Ibn Abi Talib has an advantage in everything for the rest of the Muslims. He was praised by the Prophet of Islam through several conversations (O Ali, there's no one know you but only God and I) (Almazandrani, 1991) (Al Bahrani, 2005; Al-Majlisi, 1983) and (Ali for me Is like Haron for Musa but there's no a prophet after me) (Almazandrani, 1991) (Al Bahrani, 2005; Al-Majlisi, 1983) and many other expressions of praise. Ali was presented with several issues and problems (Moughnieh, 2000). He solved it in a manner that clearly refers to his intelligence and distinguished mind including.

The issue from the pulpit (Beydoun, 2005; Albilani, 2006): It is the question indicates the strength of intuition Ali Bin Abi Talib and the capacity of his knowledge and understanding and deep thinking and maturity are as follows.

Wife asked him on the pulpit, On the issue of inheritance is unable to answer from all because it is a complex that can not be explained. But Ali Bin Abi Talib answered them directly and he was on the pulpit.

Dinar issue: woman came to Ali Ibn Abi Talib and she complained to him that her brother died and left 600 dinar and she did not get from his inheritance only to one dinar only. He said to her directly: Did your deceased brother leave a wife, two daughters, a mother b and twelve brothers and you. She said yes. He said if the share of the inheritance which is correct one dinar only.

Here, manifested the power of his knowledge and intuition. Once he learned of its share he knew the number of family members and not only that but the relationship between them and their type and the share of each. As this woman was expecting her share to be even higher, so she asked for equity the explanation for this is:

- He left two daughters with two thirds, namely 400 dinars
- A mother left her a sixth which is 100 dinars
- Leave her wife the price is 75 dinars
- The 12 brothers and sisters are left, each brother has two dinars and for hear only one dinar

This is the distribution of inheritance according to Islamic law. Had we collected these shares, it would have amounted to 600 dinars which is the total amount.

THE STORY OF LOAVES OF BREAD

Two men were eating with one of them five loaves and the other three loaves, when they put the eight bread tablets before them, a man passed by them and sat and ate with them and they ate all the bread tablets, so, the man gave them eight dirhams, theirs an dispute between them on the distribution of dirhams, so, decided to ask Ali Bin Abi Talib and explain the situation in detail, he gave to the one who owns three loaves of one dirham and for the 1 who has five loaves of 7 dirhams.

Mathematical reasoning: The eight discs are equal to twenty-four (One-third). For owns three loaves, nine (One-third), (Because he has three loaves and each loaf three (One-third), the total is nine (One-third)). Eat eight of them (Because there are twenty-four (One-third) of the three fruit equally every one of them eat eight (One-third)). The guest ate one of these three. And those who have five loaves of which fifteen (One-third). (Because it has five tablets and each disk three (One-third), so, the total is fifteen (One-third)). Eat eight of them and the guest eat seven. That is each of the three ate eight-(One-third).

The first gave the guest only one (One-third) and the second gave him seven (One-third). (Total is eight (One-third)). And since, the guest has paid them eight dirhams, so the price for any (One-third) is one dirham, that, he had eaten one (One-third) of the first person, so this person's share is 1 dirham. And also eat from the second seven-(One-third), so be seven dirhams.

The case of the mother whose pregnancy after 6 months: The second Caliph Umar Ibn Al-Khattab wanted to stone a woman ecause she was born after a 6 months pregnancy as a whore. Ali Ibn Abi Talib said to him: If she complained, the Holy Quran has the right as God Almighty says: (The duration of pregnancy and lactation is 30 months). And also says: (Mothers breastfeed their children for 2 full years for those who wanted to breastfeed, ...). If the lactation period is 2 full years (24 months) and the pregnancy and breastfeeding 30 months, the pregnancy period will be 6 months, so, Umar left the woman's age and the ruling was established for that, so, the owners did it and who took from them to this day.

The story of Zubia: Zabia in the Arabs (A pit is dug to hunt the lion was so, named because they were digging in a high place). Theirs two incidents have occurred in the reign of Ali Bin Abi Talib as follows.

First: After the lion fell, people gathered on the edge of the pit to look at lion. One of the men wanted to fall into the hole before you drop stuck with another man and the other stuck to a third man, the third man stuck to the fourth. And all four men fell in the pit with the lion and they all died. People differed from the amount of the ransom of the four people who died. Ali (peace be upon him) that the first is prey of the lion and his family one-third ransom for the second people and on the second people two-thirds of the ransom for the third people and on the third people full ransom for the fourth people. The Prophet of Islam, Muhammad said: Ali ruling for them by spending God above His throne.

Second: After the lion fell, people gathered on the edge of the pit to look at lion. And they became jostling and crowding around the crater. A man fell in it and before it falls stuck to the second, the second stuck on to the third, and the third stuck to the fourth. All four who fell and died in a ditch lion. Ali Bin Abi Talib ordered them to collect a full ransom of the tribes who witnessed the crater as well as half a ransom, one-third ransom and a quarter ransom. He gave the first family a quarter ransom because he died three above him and gave the family of the second deceased a third of the ransom because he died two above him and gave the family of the third deceased half because he died one above him. And he gave the fourth deceased's family full ransom because no one died above him, so they told the prophet of Islam Muhammad (may Allah bless him and his family) Fayed ruled Ali.

The subject of research and objective: After we touched on some mathematical issues which was presented to Ali Bin Abi Talib peace be upon him. Now, we turn to the issue mentioned by most people which is not clear to all what Ali used to solve. As it is a complex calculation and conclusion mathematical issue. Where scientifically prove the accuracy and validity of the decision Ali Bin Abi Talib through a numerical mathematical analysis, we design a sequenceand series that simulates the event and we call it (MK-Ali sequence and MK-Ali series) as we will see:
Cumulative distribution (Three men disagree among themselves) (Al-Shafi'I, 1990).

Said (Badia Bin Al-Maqri) he is a Muslim narrator, came to Ali Bin Abi Talib, three mens are fighting for the distribution of 17 camel. The first he has half, the second has one-third and The third one has one of nine. They could not divide it because they thought it would be a fracture (any part of camel). Ali said: Are you accept to add a camel from me above the camels and divide it of you?, they said: Yes, Ali add one camel with camels, it became eighteen and he gave the first half (9 camels),the second one-third (6 camels) and the third gave one from nine (2 camels) and he then recovered his camel.

Table 1: The amount of what is distributed from all (17) In each step of the distribution steps and the amount of total cumulative distribution

Steps	Mathematical simulation of distribution	Amount of quantity distributed at each step	Total distributed share	The undistributed remainder from the number 17
1	$\frac{17}{18}*17$	16.0556	16.0556	0.9444
2	$\frac{17}{18}*\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}*\left(17-\frac{17}{18}*17\right)\right)$	0.8920	16.9475	0.0525
3	$\frac{17}{18}*\left(\begin{array}{l}\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}*\left(17-\frac{17}{18}*17\right)\right)\\ -\frac{17}{18}*\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}*\left(17-\frac{17}{18}*17\right)\right)\end{array}\right)$	0.0496	16.9971	0.0029
4	$\frac{17}{18}$	0.0028	16.9998	1.6194e-04
5	$*\left(\begin{array}{l}\left(\begin{array}{l}\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}*\left(17-\frac{17}{18}*17\right)\right)\\ -\frac{17}{18}*\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}*\left(17*-\frac{17}{18}*17\right)\right)\end{array}\right)\\ -\frac{17}{18}*\left(\begin{array}{l}\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}*\left(17-\frac{17}{18}*17\right)\right)\\ -\frac{17}{18}*\left(\left(17-\frac{17}{18}*17\right)-\frac{17}{18}\left(17-\frac{17}{18}*17\right)\right)\end{array}\right)\end{array}\right)$	1.5295e-04	(17.00000) (-)*	8.9968e-06
6	The equation is too large and can not be written here	8.4969e-06	(17.00000) (-)*	4.9982e-07
7	The equation is too large and can not be written here	4.7205e-07	(17.00000) (-)*	2.7768e-08
8	The equation is too large and can not be written here	2.6225e-08	(17.00000) (-)*	1.5427e-09
9	The equation is too large and can not be written here	1.4570e-09	(17.00000) (-)*	8.5702e-11
10	The equation is too large and can not be written here	8.0942e-11	(17.00000) (-)*	4.7606e-12

Mathematically base: What happened? And what mathematical rule that it used by Ali Bin Abi Talib? How he knew that the share of the first 9, the second 6 and the third 2?. We will create a mathematical simulation of everything in the case. And prove the validity and accuracy of Ali's decision. To formulate the question by mathematical formulation through symbols:

$$\text{If } X = 17$$

We want to divide each X value as follows:

$$A = \frac{1}{2} * X$$

$$B = \frac{1}{3} * X$$

$$C = \frac{1}{9} * X$$

Note that:

$$A+B+C = \frac{1}{2} * X + \frac{1}{3} * X + \frac{1}{9} * X = \left(\frac{1}{2} + \frac{1}{3} + \frac{1}{9}\right) * X \left(\frac{9+6+2}{18}\right)$$

$$*X = \frac{17}{18} * X < X$$

That is, the quantity distributed on the three is 17/18 of the total quantity of 17. So, by completing the above equation:

$$A+B+C = \frac{17}{18} * X = \frac{17}{18} * 17 = \frac{289}{18} = (16.05555556)$$

Thus it remains 1/18 of the total number 17 is equal to:

$$\frac{1}{18} * 17 = \frac{17}{18} = (0.94444444)$$

So, if we wanted the entire distribution of X which is equal to 17 on each of the A-C, we must conduct a cumulative distribution process in the form of an endless number of steps in every step we distribute the equivalent 17/18 of which is our remaining from the previous step. If we want to represent the quantity distributed at each step in the form of sequential will be very complex and as follows. Thus the infinate number of steps From the Table 1 as follows:

- Quantity distributed at each step shall always be less than the total quantity subject to distribution in that step and represented by the remaining column
- The total quantity distributed is approaching 17 and is not equal with them only after an infinite number of steps
- The remaining amount in each step decreases and decreases at each step it approaches zero but is never equal zero unless after an infinite number of steps

We have adopted in our calculations above a program in the language of MATLAB which is as follows Alghorithm 1

Alghorithm 1; Language of MATLAB:

```
a = 17; b1 = 0; I = 1; flag = 0
while flag = = 0
   i = I
b2 = (17/18)*a
sum = b1+b2
e = 17-sum
b1= sum
a = a-b2
flag = input('flag = ')
i = i+1
end
```

Discuss the quotas of A, B and C: And thus to an infinite number of steps note from Table 2:

- Shares or the share of each member of the heirs less than a step after step, it approaches zero but is never equal only after an infinite number of distribution steps
- Cumulative share or share of the heir (A) are increasingly approaching 9 but it is never equal to 9 unless after an infinite number of distribution steps
- The stock or share the cumulative heir (B) are increasingly approaching 6 but it is not equal to 6 but only after an infinite number of distribution steps
- The cumulative stock or share of heredity (C) increases and approaches 2 but it is never equal to 2 only after an infinite number of distribution steps
- Total cumulative quotas are close to 17 but it is never equal to 17 unless after an infinite number of distribution steps

Table 2: The share obtained by each heir in each step of the distribution steps and the cumulative amount of it

Steps	The heir	The mathematical formula of the share	The amount of quota in each distribution steps	Amount of accumulated share
1	A	$\frac{17}{2}$	8.5000	8.5000
	B	$\frac{17}{3}$	5.6667	5.6667
	C	$\frac{17}{9}$	1.8889	1.8889
2	A	$\frac{17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})}{2}$	0.4722	8.9722
	B	$\frac{17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})}{2}$	0.3148	5.9815
	C	$\frac{17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})}{2}$	0.1049	1.9938
3	A	$17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)$	0.0262	8.9985
	B	$17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)$	0.0175	5.9990
	C	$17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)$	0.0058	1.9997
4A		$17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)-\left(\frac{17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)}{2}+\frac{17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)}{3}+\frac{17-(\frac{17}{2}+\frac{17}{3}+\frac{17}{9})-\left(\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17-\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}\right)}{9}\right)$	0.0015	8.9999

Table 2: Continue

Steps	The heir	The mathematical formula of the share	The amount of quota in each distribution steps	Amount of accumulated share
4	B	$17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)\cdot\left(\frac{\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}}{3}\right)\cdot\left(\frac{\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}}{9}\right)$	9.7165E-04	5.9999
C		$17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)\cdot\left(\frac{\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}}{3}\right)\cdot\left(\frac{\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{2}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{3}+\frac{17\cdot\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right)}{9}}{9}\right)$	3.2388E-04	1.9999

We have adopted in our calculations above a program in the language of MATLAB which is as follows Alghorithm 2.

Alghorithm 2; Language of MATLAB:

```
clc
clear all
x = 17; I = 1; flag = 0; A1 = 0; B1 = 0; C1 = 0
while flag = = 0
   i = i
A = x/2
B = x/3
C = x/9
flg = input('sum = ')
A1=A1+A
B1= B1+B
C1= C1+C
flg = input('step = ')
x = x-(A+B+C)
flag = input ('flag = ')
i=i+1
end
```

The second illustration (simplify the situation more): We said that the sum of half+one third+one ninth is equals 17/18. Thus remains 1/18 of the total 17 is distributed. We need to re-distribute the remaining portion each time. This process is repeated infinitely.

We discuss the shares of each heir to formulate a general Sequential calculated the share of the heir in step (i), We named it (MK-Ali sequence)

The first, second and third heirs (we calculate his cumulative inheritance as in Table 3. The sum of the heir's shares (A) for an infinite number of steps equals:

$$\sum_{i=1}^{\infty}\frac{17}{2}\left(\frac{1}{18}\right)^{(i-1)}=8.5+0.47222222+0.02623457+0.001457476+\ldots\cong 9$$

These 9 is half of 18. The sum of the heir's shares (B) for an infinite number of steps equals:

$$\sum_{i=1}^{\infty}\frac{17}{3}\left(\frac{1}{18}\right)^{(i-1)}=5.6666667+0.31481481+0.01748971+0.0009716507+\ldots\cong 6$$

These six is one third of 18. The sum of the heir's shares (C) for an infinite number of steps equals. These two is one ninth of 18.

Illustration III/simplify the case in the form of a table: Table 4 illustrates in a simplified manner what is shown in Table 2 as follows:

Table 3: The amount of shares per heir in the first six distribution steps in addition to the general format of follow-up (MK-Ali sequence) which represents the share in any steps

Heir	Steps	Mathematical calculation of the share	The general formula for sequential (MK-Ali sequence)
A	1	$\frac{1}{2}*17$	$\frac{17}{2}*\left(\overbrace{\frac{1}{18}*\frac{1}{18}*\frac{1}{18}*,\ldots,\frac{1}{18}}^{(i-1\text{times})}\right)=\frac{17}{2}\left(\frac{1}{18}\right)^{(i-1)}$
	2	$\frac{1}{2}*\left(\frac{1}{18}*17\right)$	
	3	$\frac{1}{2}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)$	Share in step i
	4	$\frac{1}{2}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)$	$\langle\frac{17}{2}\left(\frac{1}{18}\right)^{(i-1)}\rangle$
	5	$\frac{1}{2}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)\right)$	
	6	$\frac{1}{2}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)\right)\right)$	
B	1	$\frac{1}{3}*17$	$\frac{17}{3}*\left(\overbrace{\frac{1}{18}*\frac{1}{18}*\frac{1}{18}*\ldots\frac{1}{18}}^{(i-1\text{times})}\right)=\frac{17}{3}\left(\frac{1}{18}\right)^{(i-1)}$
	2	$\frac{1}{3}*\left(\frac{1}{18}*17\right)$	
	3	$\frac{1}{3}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)$	Share in step i
	4	$\frac{1}{3}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)$	$\langle\frac{17}{3}\left(\frac{1}{18}\right)^{(i-1)}\rangle$
	5	$\frac{1}{3}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)\right)$	
	6	$\frac{1}{3}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)\right)\right)$	
C	1	$\frac{1}{9}*17$	$\frac{17}{9}*\left(\overbrace{\frac{1}{18}*\frac{1}{18}*\frac{1}{18}*\ldots\frac{1}{18}}^{(i-1\text{times})}\right)=\frac{17}{9}\left(\frac{1}{18}\right)^{(i-1)}$
	2	$\frac{1}{9}*\left(\frac{1}{18}*17\right)$	
	3	$\frac{1}{9}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)$	Share in step i
	4	$\frac{1}{9}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)$	$\langle\frac{17}{9}\left(\frac{1}{18}\right)^{(i-1)}\rangle$
	5	$\frac{1}{9}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)\right)$	
	6	$\frac{1}{9}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*\left(\frac{1}{18}*17\right)\right)\right)\right)\right)$	

Table 4: Taugust 31, 2018he amount of shares per heir and the total number of shares in the first four distribution steps

Step partition	Quantity subject to distribution	The heir A	The heir B	The heir C	(A+B+C)	The total which was divided
1	17	8.5	5.666666	1.888888	16.0555555	16.0555555
2	0.9444444	0.47222222	0.31481481	0.10493827	0.8919753	16.9475308
3	0.05246914	0.02623457	0.01748971	0.005829904	0.04955418	16.997085
4	0.00291496	0.00145748	0.0009716533	0.0003238844	0.002753018	16.9998365
Cumulative total per share	8.99991427	5.99994217	1.99998006	16.9998365		

- The share of each member of the heirs after less than a step by step closer to zerobut it is never equal zero only after an infinite number of distribution steps
- The cumulative share of heredity (A) increases and approaches 9 but never equals 9 only after an infinite number of distribution steps
- The cumulative share of heredity (B) increases and approaches 6 but it is not equal to 6 never only after an infinite number of distribution steps
- The cumulative share of heredity (C) increases and approaches 2 but it is never equal to 2 only after an infinite number of distribution steps

Table 5: Detailed final reading are presented according to sequences and series which it has been deducted from the first six-step distribution

Heir	Kind the parameter	Distribution steps 1	2	3	4	5	6
A	**Share** $\left\langle \frac{17}{2}\left(\frac{1}{18}\right)^{(i-1)} \right\rangle$	8.500	0.4722	0.0262	0.0015	8.0971e-05	4.4984e-06
	Cumulative total share $\sum_{j=1}^{i} \frac{17}{2}\left(\frac{1}{18}\right)^{(j-i)}$	8.5000	8.9722	8.9985	8.9999	8.99999999	8.999999999
B	**Share** $\left\langle \frac{17}{3}\left(\frac{1}{18}\right)^{(i-1)} \right\rangle$	5.6667	0.3148	0.0175	9.7165e-04	5.3981e-05	2.9989e-06
	Cumulative total share $\sum_{j=1}^{i} \frac{17}{3}\left(\frac{1}{18}\right)^{(j-i)}$	5.6667	5.9815	5.9990	5.9999	5.99999999	5.999999999
C	**Share** $\left\langle \frac{17}{9}\left(\frac{1}{18}\right)^{(i-1)} \right\rangle$	1.8889	0.1049	0.0058	3.2388e-04	1.7994e-05	9.9964e-07
	Cumulative total share $\sum_{j=1}^{i} \frac{17}{9}\left(\frac{1}{18}\right)^{(j-i)}$	1.8889	1.993	1.9997	1.9999999	1.99999999	1.999999999
D	**Total share in step** $\left\langle \left(\frac{289}{18}\right)\left(\frac{1}{18}\right)^{(i-1)} \right\rangle$	16.0556	0.8920	0.0496	0.0028	1.5295e-04	8.4969e-06
	SUM cumulative total shares $\left(\frac{289}{18}\right)\sum_{j=1}^{i}\left(\frac{1}{18}\right)^{(j-1)}$	16.0556	16.9475	16.9971	16.9998	16.9999999	16.99999999

- The total cumulative shares approaching 17 but never equals 17 only after an infinite number of distribution steps

We have adopted in our calculations above a program in the language of MATLAB which is as follows Alghorithm 3.

Alghorithm 3; Language of MATLAB:

```
clc
clear all
i = 1; flag = 0; A1= 0; B1 = 0; C1= 0
while flag = = 0
   i = i
A = (17/2)*((1/18)^(i-1))
B = (17/3)*((1/18)^(i-1))
C = (17/9)*((1/18)^(i-1))
flg = input('sum = ')
A1 = A1+A
B1 = B1+B
C1 = C1+C
flg = input ('step = ')
i=i+1
end
```

Illustration fourth/how to choose the number 18: What made of Ali Bin Abi Talib adds one camel to make the number 18. We show that inheritance shares are cumulative. Therefore, there is a number that is half + one third + one ninthis equal 17. Assume that this number is A .. it:

$$\frac{1}{2}*A+\frac{1}{3}*A+\frac{1}{9}*A=17$$

$$\left(\frac{1}{2}+\frac{1}{3}+\frac{1}{9}\right)*A=17$$

$$\left(\frac{17}{18}\right)*A=17$$

$$A=17*\frac{18}{17}=18$$

We need one camel to host with the 17 camels to extract the half and one-third and one-ninth and then return the camel hosted to the family (Table 5). The general formula for the size of the amount distributed in step i are:

$$\left\langle \frac{17}{2}\left(\frac{1}{18}\right)^{(i-1)}+\frac{17}{3}\left(\frac{1}{18}\right)^{(i-1)}+\frac{17}{9}\left(\frac{1}{18}\right)^{(i-1)} \right\rangle$$

$$=\left\langle \left(\frac{1}{18}\right)^{(i-1)}\left(\frac{17}{2}+\frac{17}{3}+\frac{17}{9}\right) \right\rangle \setminus$$

$$=\left\langle \left(\frac{1}{18}\right)^{(i-1)}\left(\frac{153+102+34}{18}\right) \right\rangle$$

$$=\left\langle \left(\frac{289}{18}\right)\left(\frac{1}{18}\right)^{(i-1)} \right\rangle, \ldots, \text{(MK-Ali sequence)}$$

Thus, the size of the quantity that it distributed for every step (n) is a sequential as follows:

$$\left(\frac{289}{18}\right)\left(\frac{1}{18}\right)^{(i-1)},\ldots,(\text{MK-Ali series});n=1, 2, 3,\ldots,\infty$$

CONCLUSION

The general formula of consecutive representing the share of each one of the three in the distribution step (i) is:

$$\left\langle\frac{17}{n}\left(\frac{1}{18}\right)^{(i-1)}\right\rangle$$

= 2, 3.9 for person A-C, respectively and represents the sequence of the distribution step.

The general formula for sequential which represents the size of the amount distributed in step (i) the three peopleis:

$$\left\langle\left(\frac{289}{18}\right)\left(\frac{1}{18}\right)^{(i-1)}\right\rangle$$

i represents the sequence of the distribution step
We have launched the following in Eq. 1 and 2 above (MK-Ali sequence).

The general formula of the series representing the total shares of each person up to the distribution step (i):

$$\sum_{j=1}^{i}\frac{17}{n}\left(\frac{1}{18}\right)^{(j-1)}$$

i: The distribution step for which we want to caculate the total amount of shares, n = 2, 3.9 for person A-C respectively and j represents the sequence of the distribution step.

The general formula of the series which represents the sum of the three person's shares until the distribution step (i):

$$\left(\frac{289}{18}\right)\sum_{j=1}^{i}\left(\frac{1}{18}\right)^{(j-1)}$$

i: The distribution step for which we want to calculate the total amount of shares and j represents the sequence of the distribution step. We have callled the series in Eq. 3 and 4 above is (MK-Ali series). We have called the series in 3 and 4 above is (MK-Ali series):

- The cumulative share for the heir A which has (1/2) is equal to 9 after an infinite number of distribution steps
- The cumulative share for the heir B which has (1/3) is equal to 6 after an infinite number of distribution steps.
- The cumulative share forthe heir C which has (1/9) is equal to 2 after an infinite number of distribution steps
- The accuracy of the decision Ali Bin Abi Talib (peace be upon him) in determining heritable quotas (for A-9 camels) (for B-6 camels) and (for C-2 camels) after that we have proved through sequences and series above

We have adopted in our calculations above a program in the language of MATLAB which is as follows Alghorithm 4.

Alghorithm 4; Language of MATLAB:

```
clc
clear all
i = 1; flag = 0; A1= 0; B1 = 0; C1= 0; SUM1= 0
while flag = = 0
   i = i
A = (17/2)*((1/18)^(i-1))
B = (17/3)*((1/18)^(i-1))
C = (17/9)*((1/18)^(i-1))
SUM = (289/18)*((1/18)^(i-1))
flg = input('sum = ')
A1 = A1+A
B1 = B1+B
C1 = C1+C
SUM1 = SUM1+SUM
flg = input ('step = ')
i = i+1
end
```

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