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# ETNOMATHEMATHICS IN JAVANESE RIBBON: THE MEANING OF EVERY LOST OBJECT

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**Abstract**

The use of Primbon in determining the meaning of lost objects reflects how local traditions and beliefs still influence the daily practices of Javanese society. This study aims to dig deeper into how Ethnomathematics is used in Javanese culture to give meaning to everyday phenomena, such as when losing objects. The research method used in this study is the descriptive qualitative method. Data were collected through observation, interviews, and literature study. The observation was conducted by observing the Javanese Primbon calculation activities in Panican Village, Kemangkon Subdistrict, Purbalingga Regency, Central Java Province, Indonesia. The interview used in this research is semi-structured with the resource person, Mr. SH. The data source in this research uses secondary data obtained by conducting a literature study of the versatile Javanese primbon book owned by R. Gunasasmita. The results of this study indicate the existence of Ethnomathematics in giving meaning to the calculation of Primbon in Javanese culture, which uses the mathematical concept of modulo 3 and 4 to determine the meaning of lost objects, such as who the thief is, gender, skin colour, and whether the lost object will be found again.

**Keywords**: Primbon, Ethnomathematics, Lost Objects

## INTRODUCTION

Mathematics was born from human thinking related to ideas, processes, and reasoning. Mathematics originates from how humans respond to the environment, such as seeking explanations, understanding, experience, and solutions to phenomena around them (Annizar et al., 2020). Mathematics results from human culture, formed by making patterns, planning, and calculating to solve various life problems (Kudus, 2019). Mathematics is a socio-cultural product and a thinking tool to solve scientific problems, including definitions, axioms, theorems, issues, and solutions (Darmayasa, 2018). Based on some of these opinions, we know that mathematics is found in every human activity.

Mathematics is a form of culture that fulfils all elements of social life (Destrianti, 2019). Therefore, culture can be an alternative tool that can be used to study mathematics. The term mathematics in culture is Ethnomathematics (D'ambrosio, 1985). Ethnomathematics consists of two words: ethno (ethnic/cultural) and mathematics. Ethnomathematics is mathematics in culture. D'Ambrosio, a Brazilian mathematician in 1977, introduced the term ethnomathematics. Linguistically, the prefix "ethno" is defined as something comprehensive that refers to the socio-cultural context, including language, jargon, codes of behaviour, myths and symbols. The root word "mathema" means explaining, knowing, understanding, and performing activities such as coding,

measuring, clarifying, inferring, and modelling. The suffix "tics" comes from katatechne and means the same as technique (D'Ambrosio, 1994: 449).

Ethnomathematics is a cultural object that contains mathematical concepts in a particular society. The Javanese tribe is huge in Indonesia. People who recognize themselves as Javanese live in Yogyakarta, Central Java, East Java, and West Java (Aditya, 2017). One of the islands known for its many traditions and cultures is Java. Javanese people still live in their native areas and uphold the knowledge of Javanese culture (Kejawen) (Suraida et al., 2019).

Javanese people, especially in the Purbalingga region, still use a traditional calendar system called pawukon or primbon. Primbon culture grew and developed thanks to the influence of Islam in the archipelago, especially the archipelago (Lubis et al., 2021). As Javanese local wisdom, primbon has become a standard of daily life for Javanese people (Arfianti et al., 2022). The dating tradition still exists and is often used by Javanese people to determine good days, such as finding the best time to build a house, get married, and calculate the meaning of lost objects. Primbon calculations are usually passed down from generation to generation and are still used by Javanese people (Hartono, 2016). The calculation in primbon uses the Javanese calendar, which calculates the circulation of the moon. Each market day, month, and year has its calculation. These calculations have been used to identify events or things that might happen tomorrow or later. Most Javanese people still believe and trust in this, so this tradition is still strong among them, one of which is when we lose an object. The people of Purbalingga still use primbon calculations to determine the loss of an object. In daily life, it is known that there are calculations regarding whether or not a stolen object will return.

Then, what is the law of believing in Javanese astrology? Believing in Javanese primbon is valid because it is a form of wasilah. Wasilah is an intermediary to get closer to Allah (Mulyati, 2016). Not that we trust Javanese primbon completely, but Javanese people, when they want to know the meaning of each lost object we use neptu; neptu is a Javanese market day value, also called the value of a person's birthday that can be calculated or summed up (Yanti, 2023). So, in determining the meaning of each lost object, Javanese people use the neptu guidelines (Arfianti et al., 2022).

Based on research conducted by Lestari (2020) shows that in the matchmaking calculation carried out by the people of Giring village, there are mathematical aspects in the form of modulo concepts and number operations, namely addition and division. In addition, research conducted by Utami (2019) shows that matchmaking calculations using Javanese primbon have numerical values such as basic numbers, remainder theorem, modulo, and congruence modulus in formal mathematics. Research on Ethnomathematics in Javanese primbon, namely the meaning of each lost object, has yet to be found. Therefore, this research aims to discover the role of mathematics in calculating primbon regarding the meaning of each lost object.

## METHOD

The method used in this research is the descriptive qualitative research method. The object studied was a Javanese Primbon found in Panican Village. The data collection methods used were observation, interview and literature study. The observation was conducted by observing the calculation of Javanese Primbon in Panican Village, Kemangkon Subdistrict, Purbalingga Regency, Central Java Province, Indonesia. The type of interview used in this research is a semi-structured interview with the resource person, Mr SH, who is the taker of the Al-Hikmah Mosque in Panican Village. He is also a religious expert. Although he can calculate the Javanese primbon calculation, he never believes in the calculation. Primbon's calculations are only used to increase his knowledge. This interview aims to determine the requirements, namely how to calculate weton and what criteria will be obtained from the weton calculation. The data source in this research uses secondary data obtained by conducting a literature study of the versatile Javanese primbon book owned by R. Gunasasmita. The data analysis consists of data reduction, presentation, and conclusion drawing.

## RESULTS AND DISCUSSION

For Javanese, knowledge of weton is essential because it dramatically influences social life. Neptu is a number that calculates the Javanese day, market value (nilai pasar), month and year. Each day, market, month and year has a different value. Calculations (neptu) are essential in the life of Javanese society. Almost every need must use calculations.

1. Day

Table 1. Neptu Hari

| Day | Value |
|---|---|
| Ahad/Week | 5 |
| Monday | 4 |
| Tuesday | 3 |
| Wednesday | 7 |
| Thursday | 8 |
| Friday | 6 |
| Saturday | 9 |

2. Market Value (Nilai Pasar)

Table 2. Neptu Pasar

| Day | Value |
|---|---|
| Kliwon | 8 |
| Legi | 5 |
| Pahing | 9 |
| Pon | 7 |
| Wage | 4 |

Indeed, we have lost something; of course, we will be disappointed or angry. However, it cannot be known who stole it without evidence. In daily life, it is known that there is a calculation of whether the stolen item will be returned or not. The people of Purbalingga, especially in Panican village, still adhere to Javanese beliefs and believe in the calculation of Primbon, one of which is

determining the meaning of losing an object. Based on the results of interviews with Mr. SH and literature studies from the versatile Javanese Primbon book owned by R. Gunasasmita, namely:

1. Calculation of Object Loss

   The calculation rules are as follows:

   Sum the day and market values at the time of the lost object. After summing, the result of the sum is divided by 3. If there is no remainder, it is considered to have a remainder

   Table 3. Loss of objects

| Remainder of Division | Meaning |
|---|---|
| 1 | Lost objects will not be recovered |
| 2 | The lost object is likely to be found |
| 3 | The lost object can be found, and the thief will have a hard time with it |

   Example: Elma Safitri lost her bracelet on Monday. Pon means (4 + 7 = 11). Then the sum result is 11. Then, the sum result is divided by 3, so two will be left over. By Table 1, if the calculation has a remainder of 2, Elma Safitri's bracelet will likely be found, and the thief will get in trouble.

2. Finding the Thief

   The calculation rules are as follows:

   Sum the day value and market value at the time of the loss. After adding them up, divide the sum by 3. If there is no remainder, it is considered to have a remainder of 3.

   Table 4. Knowing the Thief

| Remainder of Division | Meaning |
|---|---|
| 1 | Are your close friends |
| 2 | Is a person you often meet and live under the same roof as you |
| 3 | Is someone else you do not know |

   Example: Elma Safitri lost her bracelet on Monday. Pon means (4 + 7 = 11). Then the sum result is 11. Then, the sum result is divided by 3, so two will be left over. By Table 1, if the calculation has a remainder of 2, it is most likely that the thief is a close friend of Elma Safitri.

3. The Thief is Male or Female

   The calculation rules are as follows:

   Sum the day value and market value at the time of the loss. After summing up, the result of the sum is divided by 3. If divided, there is no remainder; it is considered to have a remainder of 3.

   Table 5. The Thief is Male or Female

| Remainder of Division | Meaning |
|---|---|
| 1 | A man |
| 2 | A woman |
| 3 | It can be male and can also be female |

   Example: For example, Elma Safitri lost her bracelet on Monday. Pon means (4 + 7 = 11). The sum result is 11. Then, the sum result is divided by 3, and two will be left over. By table 1, if the remaining 2, the thief is most likely a woman.

4. Knowing the Thief's Skin Color

   The calculation rules are as follows:

Sum the day value and market value at the time of the loss. After summing up, the result of the sum is divided by 3. If there is no remainder, it is considered to have a remainder of 3.

Table 6. Skin Color of the Thief

| Remainder of Division | Meaning |
|---|---|
| 1 | The thief's skin colour is black |
| 2 | The thief's skin colour is reddish and slightly brown |
| 3 | The thief's skin colour is slightly light or white |

Example: Elma Safitri lost her bracelet on Monday. Pon means (4 + 7 = 11). Then the sum result is 11. Then, the sum result is divided by 3, so two will be left over. By table 1, if the remaining calculation is 2, the thief likely has a reddish and slightly brown skin colour.

5. Missing or not an object

The calculation rules are as follows:

Sum the day value and market value at the time of the loss. After summing, the result of the sum is divided by 4. If there is no remainder, it is considered to have a remainder of 4.

Table 7. Whether or not an object is missing

| Remainder of Division | Meaning |
|---|---|
| 1 | The object in question may not be missing, or it may have been forgotten. If it is lost, it is due to your negligence. |
| 2 | The object in question was stolen by a relative with whom you may be familiar. |
| 3 | A friend or distant relative stole the object in question. |
| 4 | The object in question was taken by someone else you do not know. |

Example: Elma Safitri lost her bracelet on Monday. Pon means (4 + 7 = 11). The result of the sum is 11. Then, the result of the sum is divided into four parts, which will remain 3. By table 1, if the calculation remains 3, it is most likely that a friend or distant relative stole the object in question.

Description:

Based on the above calculations from the case of Elma Safitri's lost bracelet, it can be concluded that her bracelet can be found again. If stolen, then the thief is a close friend of Elma Safitri; the thief is a woman with a reddish and slightly brown skin colour. However, these calculations are not absolute. We should not accuse people carelessly without evidence because it will cause slander.

Based on the above Primbon calculation, we can conclude that there is a mathematical concept, namely modulo, in the Primbon calculation:

1. Modulo 3

For example, let us take one of the primbon calculations, namely the calculation of knowing the colour of the thief's skin.

We first add up the day and market values during the loss. Dividing the sum of the day value and market value by 3, the remainder becomes the benchmark, which is the concept of modulo 3.

$$a \text{ mood } 3 = c \rightarrow a = 3b + c$$

Where: a = the sum of the day value and market value (neptu) of lost objects

b = integer number

c = remainder modulo (0,1,2)

2. Modulo 4

Let's take the primbon calculation, calculating whether an object is lost. We first add up the day and market values during the loss. Dividing the sum of the day value and market value by 4, the remainder becomes the benchmark, the concept of modulo 4.

$$a \text{ mood } 4 = c \rightarrow a = 4b + c$$

Where: a = the sum of the day value and market value (neptu) of lost objects

b = integer number

c = remainder modulo (0,1,2,3)

## CONCLUSION

Based on the results and discussion, it can be concluded that the calculation of Primbon in Javanese culture uses mathematical concepts modulo three and modulo 4 to determine the meaning of lost objects, such as who the thief is, gender, skin colour, and whether the lost object will be found again. This tradition is still practised in the Panican Village community. It shows how Ethnomathematics is essential in giving meaning to everyday events in Javanese culture. This study provides new insights into how traditional mathematics is used in specific cultural contexts to make sense of everyday phenomena.

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