Jurnal MATH-UMB.EDU
Vol 13, (3), 2026

ETHNOGRAPHIC STUDY: ETHNOMATHEMATICS IN PALEMBANG SONGKET CLOTH MOTIFS

Wahyu Angraini[1*], Sri Dahlia[2] , Elly Susanti[3] , Marhayati[4]
[1,2,3,4] Universitas Islam Negeri Maulana Maliki Ibrahim, East Java, Indonesia
wahyuanggraini2112@gmail.com[1]

Received: 09-06-2026 Revised: 10-07-2026 Accepted: 22-07-2026 Published: 25-07-2026

Abstract

This study explores the relationship between ethnomathematics and Palembang songket cloth motifs through an ethnographic approach. The research objective is to identify and describe the mathematical concepts embedded in the motif designs of Palembang songket. Using ethnographic observation, documentation, and interviews with a museum curator, the study analyzed the motifs of Lepus-type songket cloth. The findings reveal that Palembang songket motifs contain several mathematical elements, including number patterns (arithmetic sequences), geometric transformations (reflection across x- and y-axes), and plane geometry figures such as parallelograms, irregular hexagons, squares, rectangles, rhombuses, and equilateral triangles. This study underscores the importance of integrating local cultural heritage into mathematics education, providing a contextual foundation for ethnomathematics-based learning in Indonesian schools.

Keywords: Ethnographic; Ethnomathematics; Palembang Songket; Motifs

INTRODUCTION

Indonesia is a country with riches extraordinary culture ordinary . Indonesia that stretches from Sabang to Merauken own characteristics riches non -existent culture both of them . Every island have pattern culture unique and distinctive that reflects identity and tradition its people . Heritage Nusantara culture is not only limited to buildings , dance and song , but also engraved beautiful in cloth traditional or ' wastra '. The term " wastra " has its roots in from Language Sanskrit , which means cloth . According to the Big Indonesian Dictionary (KBBI), wastra defined as cloth traditional and full of meaning and symbols . Meaning and symbols This come true in dimensions color , size , and material cloth . Example cloth traditional which includes textiles are batik, woven cloth , and songket . Between various cloth traditional , cloth songket steal attention with The motifs are intricate and charming . The fabric comes from from South Sumatra and Malay regions this , has long been symbol elegance and social status .

Historic city of South Sumatra, besides famous with food its characteristics are also famous with cloth weaving the enchanting songket . Tradition weave songket in Palembang has ongoing since the time of the Palembang kingdom , approx 1629 AD. At that time , songket become clothes exclusive for the nobility , with motifs and designs that indicate social status users . Popularity songket Keep going increased in the 16th and 17th centuries , when fabric that uses thread gold and silver become prima donna among society . According to Purwanti and Siregar (2016) love to songket This inherited from generation to generation , and the kings of Palembang along with them relatives palace always wearing songket in various official events , until the time of the Palembang Sultanate (1666-1823 AD). With referring to opinion historian *Robyn* and *John Maxwell* , Agustini (2004) explain that tradition weaving silk and songket originate from Chinese and Indian traders . Traders This dominate activity trade in the Southeast Asia region through track the waters of the Strait of Malacca and the surrounding area ports on Sumatra Island as well area coast north of Java Island during the period around 15th to 17th centuries AD .

Interestingly , behind the beauty of the fabric motifs songket , stored draft integrated mathematics in the manufacturing process .

The intricate and beautiful motifs on Palembang songket often based on forms such as lines, squares , triangles , nets , and others For create repeating patterns . According to Fathani (2009) said that Mathematics integrated in various aspect life humans , such as farming , art , building models , making calendars , jewelry , carvings , and more again . This is show that mathematics is part from culture and history man. Whereas according to *Van de Walle* (2006) Since ancient times , humans has utilise draft mathematics in activity daily they . Various group culture own knowledge the mathematics alone, different One each other. Mathematics born from activity humans, and therefore , mathematics No can separated from life human . Mathematics realized Because activity human " mathematics as activity human beings ” (Soedjadi, 2007). When education, mathematics , and culture combined , then formed ethnomathematics . Ethnomathematics learn connection between mathematics and culture , and how mathematics used in various cultures in the world.

Ethnomathematics is form evolving mathematics in context culture certain or as an integral part of something culture . Ethnomathematics can also interpreted as mathematics owned by the group public certain or mathematics that reflects traditions and values culture local . According to *D 'Ambrosio* (2007) If related with the world of education , Ethnomathematics is field studies that study history , philosophy , and culture mathematics . This study research How mathematics develop in various culture and how mathematics used in life society . Ethnomathematics also has implications for teaching mathematics , namely How mathematics can taught with more contextual and relevant with culture student . He emphasized that mathematics No only found in schools , but also embedded in various aspect life , including culture and arts . In art cloth , such as cloth weaving , we can find various representation draft mathematics . For example , geometric motifs on fabric weaving reflect understanding weaver about geometric concept such as lines, angles , and symmetry . This matter show that mathematics No only abstraction However , ethnomathematics also has implementation relevant practice in activity everyday . Therefore that , studying ethnomathematics can help student understand mathematics with more good and connect it with culture and experience they.

Recent studies have shown that ethnomathematics has evolved beyond merely identifying mathematical concepts embedded in cultural artifacts toward developing culturally responsive mathematics education that promotes students' conceptual understanding, critical thinking, and appreciation of local heritage. A systematic review by Iskandar et al. (2022) demonstrated that geometry remains the dominant topic in ethnomathematics research, particularly through the exploration of traditional artifacts. Furthermore, Batiibwe (2024) emphasized that ethnomathematics serves as an effective bridge between academic mathematics and learners' cultural experiences, while Wulandari et al. (2024) highlighted that integrating local culture into mathematics instruction enhances students' engagement and contextual understanding across different cultural settings. These findings indicate that ethnomathematics has become an increasingly important approach for designing meaningful and culturally relevant mathematics learning.

This study draws on several relevant prior studies related to ethnomathematics in songket cloth motifs. Syahriannur (2019) examined geometric principles such as symmetry, transformation, reflection, and repetition in Minangkabau buffalo-motif songket. However, no study has specifically examined Palembang songket from an ethnomathematics perspective that simultaneously addresses number patterns, geometric transformations, and plane geometry in an integrated and systematic manner.

Recent studies have demonstrated that ethnomathematics research has expanded from documenting mathematical concepts embedded in cultural artifacts to exploring their educational potential in mathematics learning. For instance, Sari et al. (2024) highlighted that Indonesian woven fabrics provide rich mathematical contexts, particularly for geometry learning, through

various geometric patterns and transformations. Likewise, Iffah et al. (2025), in their systematic literature review, reported that ethnomathematics research in Indonesia has increasingly focused on traditional cultural products, with geometry being the most frequently investigated mathematical topic. Furthermore, Pratama and Yelken (2024), through a meta-analysis, concluded that ethnomathematics-based learning has a significant positive effect on students' mathematical literacy. These findings indicate that ethnomathematics has developed into an important research field; however, comprehensive investigations of specific cultural artifacts that simultaneously examine number patterns, geometric transformations, and plane geometry remain limited.

This research gap motivates the present study, which aims to reveal the mathematical concepts embedded in Palembang songket motifs, including the mathematical structures, measurement aspects, and repeating patterns, thereby contributing to the body of knowledge on ethnomathematics-based mathematics education in the Indonesian cultural context.

METHOD

Study This use method qualitative with approach ethnography For study ethnomathematics in fabric motifs songket Palembang . Approach ethnography chosen Because in line with objective ethnomathematics , namely For understand ideas, techniques and methods mathematics contained in in something culture from corner view member culture said . Research This will examine draft embedded mathematics in fabric motifs songket with method observe and analyze parts of the fabric motif songket . Subject study This is cloth Palembang songket.

An ethnographic approach is particularly appropriate for investigating ethnomathematics because it enables researchers to understand mathematical knowledge as it is embedded in cultural practices, artifacts, and the lived experiences of community members. Through prolonged observation, interviews, and documentation, ethnographic research captures not only the mathematical structures represented in cultural products but also the meanings and practices that underlie their creation. This approach therefore provides a comprehensive framework for interpreting mathematical ideas within their authentic cultural context.

In do exploration ethnomathematics , researchers start with four question general which is the core of principles ethnography , namely "where to start looking for ?", " How see ?", " How recognize that you have find something significant ? ", “ How understand What is that ?". The results of data collection are collected in form images , videos, and notes field , then analyzed For see connection between system knowledge mathematical and cultural and for see conception mathematically existing fabric motifs songket said . Next findings the explained in results study this . Based on four question general this , the stages study arranged in Table 1.

The research setting is MTsN 1 Rantauprapat, located in South Sumatra, Indonesia. The primary research informant was the curator of the Balaputa Dewa Museum in Palembang, selected purposively because of their authoritative knowledge of the history, types, and production processes of songket weaving. Fieldwork was conducted over a period of approximately two months, during which the researchers performed direct observation of songket cloth specimens, conducted structured interviews with the museum curator and local craftsmen, and documented the motifs through photography and field notes. Data analysis was conducted qualitatively through a systematic and comparative process: the collected images, interview transcripts, and field notes were examined to identify mathematical elements embedded in the motifs. Data credibility was ensured through triangulation of observation, interview, and documentation sources, as well as cross-referencing with relevant ethnomathematics literature. The study specifically focuses on Lepus-type Palembang songket cloth, which was selected based on its representativeness and the richness of its mathematical structures.

Table 1. Research Table Ethnomathematics

Frequently Asked Questions	Initial Answer	Initial step	Activity Certain	Instruments Used
Where to go start look for ?	In activity make cloth songket performed by people from Palembang where there nature mathematical practice and also requires patience as well as accuracy in make cloth songket typical Palembang.	Understand meaning from pattern cloth songket and explore characteristi cs from the pattern	Do interview with people who have knowledge about cloth Palembang songket or to Palembang people who make or craftsmen cloth songket.	Observation, Interviews, and documentation
How method see it ?	Investigate aspect Making cloth songket and culture cloth songket related with mathematics with use method observation , interviews , documentation as well as explore patterns on the fabric songket .	Review existing literature about cloth Palembang songket for understand methodology used in similar research as well as do interview to expert cloth songket or craftsmen cloth songket.	Determine what ideas exist Contained in fabric motifs songket and activities manufacturing cloth related songket with mathematics .	Interviews and documentation .
What's that ?	Palembang songket cloth is cloth typical originating from from Palembang and has been used by the nobility or king since century to 16M.	Identifying the pattern contained in the fabric songket , as well as meaning culture in local communities .	Identifying characteristics in fabric motifs Palembang songket for exercise mathematics . This show that the cloth motif Palembang songket indeed own character mathematics seen from element system knowledge	Interviews and documentation .

			and art used in life daily .	
What does it mean ?	Meaning culture , social , and potential mathematical in a functioning local society as a symbol of identity and tradition .	Understanding meaning existing symbols in fabric motifs songket Palembang as well as explore draft integrated mathematics to in design and use.	Explain connection the between two knowledge systems mathematics and culture . explains mathematics the concept contained in the cloth motif Palembang songket .	Documentation data analysis .

RESULTS AND DISCUSSION

Based on observation , interaction interviews and explorations conducted by researchers, it is known that cloth songket is one of the type cloth woven fabric that is sungsung and signed and woven One one by one , and There are also those whose manufacturing process involves carving and pressing For make other patterns . For introduction cloth weaving in South Sumatra is estimated Already There is since era jalengka whereas For cloth songket estimated Already There is since the era of the Sriwijaya Kingdom because there are several statues of the embodiment found in Pali district use cloth weaving suspected motive is cloth songket , but start Lots use cloth songket among public after the sultanate period . Motifs and patterns cloth The songket that exists in South Sumatra has three type cloth main namely in between lepus , berante and tabur . There are also songket motifs from plants or flowers such as bungo pacik , bungo cino , bungo inten , bungo jasmine, tampuk mangosteen , Japanese flower , gold heart , stem bamboo shoots , wood flowers Apoy, and Limar Bungo Rose.

Songket cloth lepus is one of the the cloth quite popular or Lots in demand due to thread gold used more dominant . However in manufacturing cloth songket from beginning Already use thread gold so that on beginning its use only may use cloth songket just women , because majority public Muslims during the sultanate forbid men use cloth songket Because in teachings Islam men forbidden use goods made from gold . Over time Lots thread synthetic that can resemble or almost the same with color gold so that man Can use cloth songket until moment This . There are also differences tool in manufacturing cloth songket era Formerly with Nowadays , in the present era first manufacturing process cloth songket use a tool called *" gedokan "* However along with it walk time manufacturing cloth songket Can done with machine to be more make things easier as well as speed up in the workmanship.

Ethnomathematics in Palembang songket cloth

On the cloth this Palembang songket contain geometric concept plane shape , concept geometry transformation and geometric number sequence . For explanation draft depicted in the sketch following.

Figure 1. Lepus Songket cloth

Number Patterns

Number patterns are mathematical structures that involve regularities and predictable relationships among numbers. Identifying and generalizing these regularities enables learners to develop algebraic reasoning, recognize mathematical relationships, and formulate general rules that can be applied to similar situations. Pattern exploration is therefore considered a fundamental component of mathematical thinking and early algebraic development (Jackson & Stenger, 2024). Recent studies further emphasize that number pattern activities play a fundamental role in developing students' algebraic thinking and generalization skills. According to Maula et al. (2024), the process of identifying and generalizing number patterns enables learners to construct mathematical rules from recurring relationships, while Jackson and Stenger (2024) highlighted that pattern-based learning is one of the most effective approaches for fostering mathematical generalization. Furthermore, Lee and Lee (2023) demonstrated that students' pattern generalization strategies provide important evidence of mathematical reasoning and support the development of algebraic thinking. There are pattern the numbers contained in cloth songket Palembang lepus , pattern the counted with many gold-thread stitches contained in the pattern namely among others .

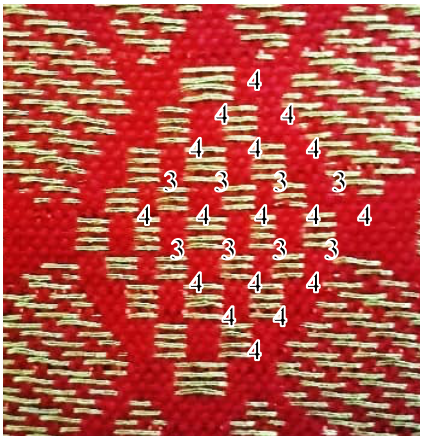

Figure 2. Number pattern

There is a number pattern on the gold thread stitches which are neatly arranged and form a number pattern where each row has a different number, namely:

(4) = 4
(4+4) = 8
(4+4+4) = 12
(3+3+3+3) = 12
(4+4+4+4+4) = 16
(3+3+3+3) = 12
(4+4+4) = 12
(4+4) = 8
(4) = 4

Each row has a difference of 4, 4, 0, 4, -4, 0, -4, -4. And the initial pattern has the same repetition 16 times throughout the songket cloth.

Figure 3. Lepus songket cloth

Reflection

Reflection is a fundamental geometric transformation in which every point of a figure is mapped to a corresponding point across a line of reflection while preserving distances, angle measures, and shape. As a result, the reflected image is congruent to the original figure but appears as its mirror image. Reflection plays an essential role in understanding symmetry and spatial reasoning, which are fundamental concepts in geometry learning (Hardiyanto et al., 2024).

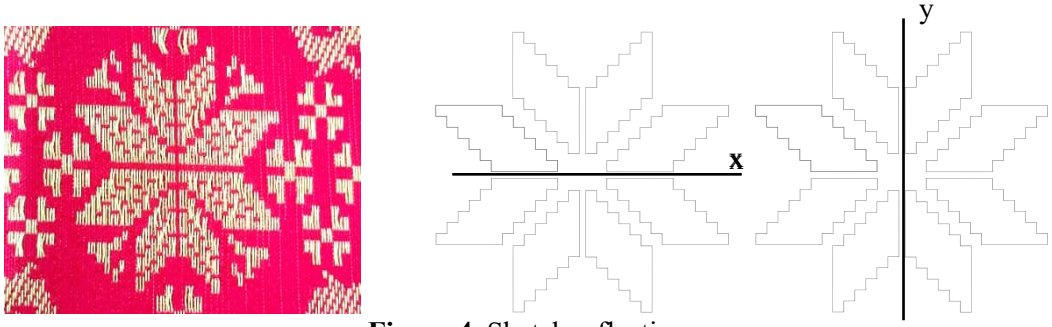

Figure 4. Sketch reflection

Reflection in geometry is reflective transformation every point from something object through axis reflection , producing symmetrical image to the axis . In context this , axis reflection can in the form of x- axis or y -axis , depending on the direction desired reflection . Figure **6** show initial object and results reflection . Object the reflected through axis reflection that can in the form of x- axis or y- axis , resulting in symmetrical shadows to axis. In reflection this , every point from initial object cloth songket lepus reflected through x- axis and y -axis . As a result , the horizontal position of every point changed sign , whereas position vertical still same . This results in identical shadows but backwards horizontally .

From the results which show sketch reflection to x- axis , visible that the motif is printed on the cloth mirrored to x- axis , resulting in the same shadow but backwards vertical . This means that every the motif elements that are above x- axis on the object original Now be under x- axis on the shadow , and vice versa .

Reflection in geometry is method For visualize symmetry with reflect object to axis certain. Reflection to x- axis changes sign y coordinate , resulting in inverted image in a way vertical . On the other hand , reflection to y- axis changes sign x coordinate , resulting in inverted image horizontally . Analysis This help in understand How object geometric can reflected and remains maintain symmetry in two- dimensional space.

Geometry of Plane Shapes

Element geometry like points , lines, planes and space is element building blocks various shapes and objects in geometry (Fuat, 2020). Meanwhile according to Kiselev (2006) geometry is branch mathematics that

studies measurement and properties space , as well as connection between points , lines, angles , and surfaces . Geometry used For understand and describe form as well as structure in two- dimensional and three-dimensional space dimensions . On the fabric this Palembang songket there is a number of a number of element field that is among them.

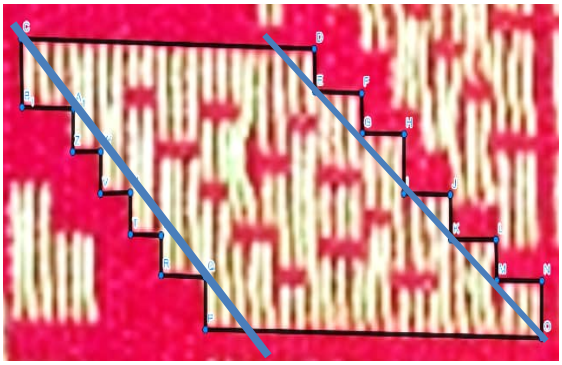

Figure 5. Lepus Songket Sketch

Figure 5, after measuring the gold thread and red thread that bind the pattern on the songket cloth, the researchers obtained the following dimension.

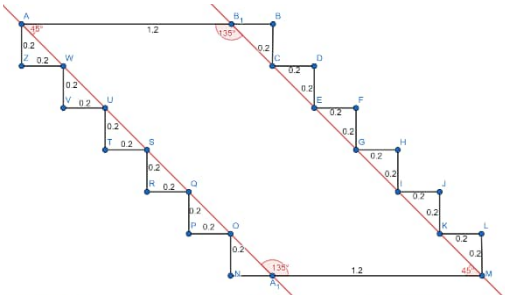

Figure 6. Size of the lepus songket sketch

From the measurements carried out directly, the following dimensions were obtained.

Table 2. Size of lepus songket cloth

Name	Size/Quantity
Many sides	24 sides
Length of side $\overline{AB} = \overline{MN}$	1.2 cm
Side lengths BC, CD, DE, EF, FG, GH, HI, IJ, JK, KL, LM, NO, OP, PQ, QR, RS, ST, TU, UV, VW, WZ, ZA	0.2 cm
Length of the cutting line $\overline{AA_1} = \overline{MB_1}$	1.6 cm
Many angles	4 corners
The size of the acute angle ∠ A = ∠ M	45°
The size of the obtuse angle ∠ A^1 = ∠ B^1	135°

Based on Table 2 , we can obtain some information regarding the Lepus songket cloth sketch. is definition and some characteristic important from get up on.

a). Opposite side Equal in length : Opposite sides in get up the parallel and have the same length . The sides the with notation AB_1 and M A_1, as well as A $A_1$and B_1M , then 1 cm ‖ 1 cm and 1.6 cm ‖ 1.6 cm .

b). Opposite angles Equal in measure : Opposite angles in get up the own the same size . That is $\angle A$ and $\angle$ M , as well as $\angle$ $B_1$and $\angle$ A_1, then $\angle$ 45 ° = $\angle$ 45 ° and $\angle$ 135 ° = $\angle$ 135 °.

c). Amount adjacent angles : The sum of two adjacent angles in a shape the is 180 degrees (angle supplementary). So, $\angle$ 45 ° + $\angle$ 135 ° =180 ° and $\angle$ 45 ° + $\angle$ 135 ° =180 ° .

d). Diagonals intersect divide equally Length : Inner diagonals get up the divide equally length . If the diagonals are is A M and B_1A_1, then the point of intersection of the diagonals divides each diagonal into two parts of equal length.

Plane shape with two pairs of parallel and equal sides long , and opposite angles The same large is a parallelogram . Properties unique parallelogram , like diagonals that are opposite each other divide equally length and supplementary angles , making it become topic important in studies geometry and its applications in various field . So, plane shape as shown in Figure 6 is get up parallelogram due to get up the fulfil conditions plane shape parallelogram.

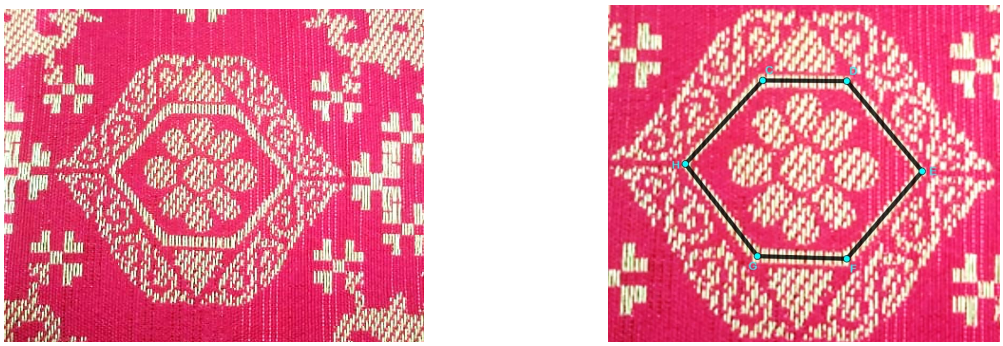

Figure 7. Sketch of lepus songket cloth

From figure 7 , after measuring the gold thread and red thread that bind the pattern on the songket cloth, the researchers obtained the following dimensions.

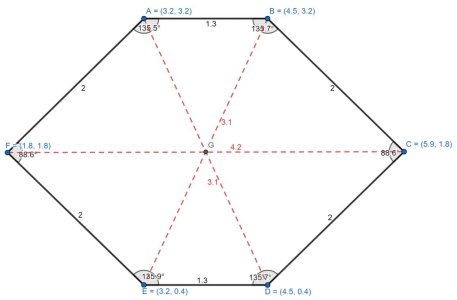

Figure 8. Size of the sketch of the lepus songket cloth

From the measurements carried out directly, the following dimensions were obtained.

Table 3. Size of lepus songket cloth

Measurement results	Size
Many Sides	6 (AB, BC, CD, DE, EF, FA)
Display Side	AB = 1.3 cm, BC = 2cm, CD = 2 cm, DE = 1.3 cm, EF = 2 cm, FA = 2 cm
Angle Size	∠ FAB = 135.5°, ∠ ABC = 135.7°, ∠ BCD = 88.6°, ∠ CDE = 135.7°, ∠ DEF = 135.8°, ∠ EFA = 88.6°
Diagonal Length	AD = 3.1 cm, BE = 3.1 cm, CF = 4.2 cm
Diagonal Intersection Point	AG = 1.55 cm, BG = 1.55 cm, CG = 2.1 cm, DG = 1.55 cm, EG = 1.55 cm, FG = 2.1 cm

Based on Table 3 , we can obtain some information regarding the Lepus songket cloth sketch is definition and some characteristic important. Plane shape that has six sides and six angle, has a number of characteristic typical from plane shape following is.

a). Length of side the same : in figure 8 there are two sides that are not the same length as fourth the other side .
b). Corner same : in figure 8 there are two angles that are not Equal in measure with fourth corner other .
c). Symmetry : in figure 8 own symmetry rotation as many as 6 times and 6 axes symmetry fold
d). Diagonal: in figure 8 there are 9 diagonals. Three of them are is the main diagonal that divides get up the into two equal parts big .

Plane shape with six sides and six angle that can in the form of regular or no regular is hexagon . Hexagon regular own same side the same length and angle big , and own Lots characteristic symmetry . So the plane shape which is shown in Figure 8 is irregular hexagon due to there are two conditions that do not fulfilled that is there are two sides that are not the same length as fourth side other as well as there are two angles that are not Equal in measure with fourth corner other.

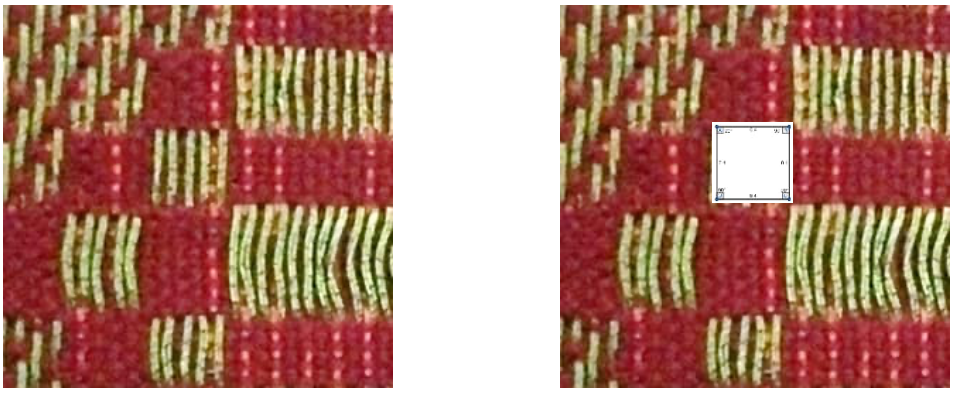

Figure 9. Sketch of Lepus Songket Cloth

From Figure 9 , after measuring the gold thread and red thread that bind the pattern on the songket cloth, the researchers obtained the following dimensions.

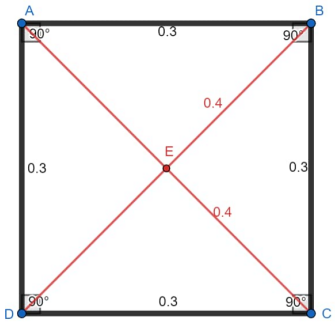

Figure 10. Size of the Lepus Songket Cloth Sketch

From the measurements carried out directly, the following dimensions were obtained.

Table 4. Size of Lepus Songket Cloth

Measurement results	Size
Many Sides	4 (AB, BC, CD, DA)
Side Length	AB = 0.3 cm, BC = 0.3 cm, CD = 0.3 cm, DA = 0.3 cm
Angle Size	∠ ABC = 90°, ∠ BCD = 90°, ∠ CDA = 90°, ∠ DAB = 90°
Diagonal Length	AC = 0.4 cm, BD = 0.4 cm
Point Diagonal Cut	AE = EC = 0.2 cm, BE = ED = 0.2 cm

Based on Table 4 , we can obtain some information regarding the Lepus songket cloth sect. is definition and some characteristic important from get up on :

Plane shape that has four sides and four angles , some characteristic typical from plane shape following is.

a). Same side Long : All side in table 4 own the same length .
b). Right angle : Every corner in table 4 is right angle (90 °).
c). Diagonals are equal in length and perpendicular straight : get up the has two equal diagonals long and interconnected upright straight One each other. These diagonals also divide One each other into two equal parts long .
d). Symmetry : get up the own symmetry fold as much as four times and symmetry rotation as much as four times (90 ° , 180 ° , 270 ° , and 360 °).

Get up two- dimensional flat that has four same side long and four equal angles big , all of which is right angle is square shape . Square often found around we and used in various application practical and theoretical . So plane shape as shown in Figure 11 is rectangle due to fulfil conditions from rectangle .

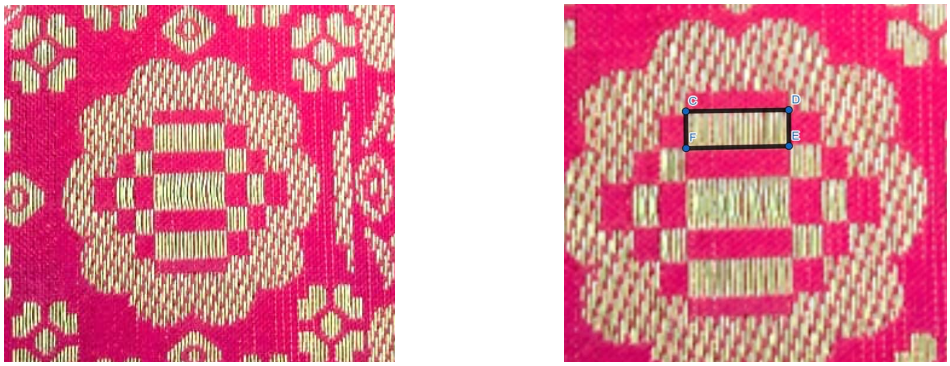

Figure 11. Sketch of Lepus Songket Cloth

From Figure 11 , after measuring the gold thread and red thread that bind the pattern on the songket cloth, the researchers obtained the following dimensions.

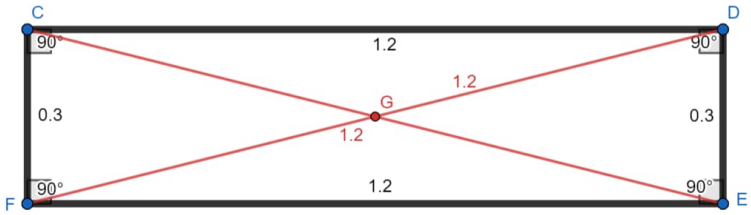

Figure 12. Size of Lepus Songket Cloth Sketch

From the measurements carried out directly, the following dimensions were obtained.

Table 5. Size of Lepus Songket Cloth

Measurement results	**Size**
Many Sides	4 (CD, DE, EF, CF)
Side Length	CD = 1.2 cm, DE = 0.3 cm, EF = 1.2 cm, FC = 0.3 cm
Angle Size	∠ FCD = 90 ° , ∠ CDE = 90 ° , ∠ DEF = 90 ° , ∠ EFC = 90 °
Diagonal Length	CE = 1.2 cm, DF = 1.2 cm
Point Diagonal Cut	AG = GC = 0.6 cm, BG = GD = 0.6 cm

Based on Table 5 , we can obtain some information regarding the Lepus songket cloth sect. is definition and some characteristic important from get up on :

Plane shape that has four long side every opposite side Equal in length and four angles . Some characteristic typical from plane shape following is.

a). Opposite side Equal in length : Partner opposite side in rectangle own the same length . If long side long is $\overline{CD}$(1.2 cm) and $\overline{EF}$(1.2 cm) and length side short is $\overline{CF}$(0.3 cm) and $\overline{DE}$(0.3 cm) .

b). Right angle : All corner in rectangle is right angle (90 °).

c). Same diagonals Long : Rectangle has two equal diagonals length . These diagonals share One each other into two equal parts long .

d). Symmetry : Rectangle own symmetry fold twice (through the horizontal and long lines) and

symmetrical rotation twice (180 ° and 360 °).

Get up two- dimensional flat that has four side with partner opposite sides Equal in length and four right angle is Rectangle. Shape rectangle often found around we and used in various application practical and theoretical . So plane shape as shown in Figure 12 is rectangle due to fulfil conditions from plane shape rectangle.

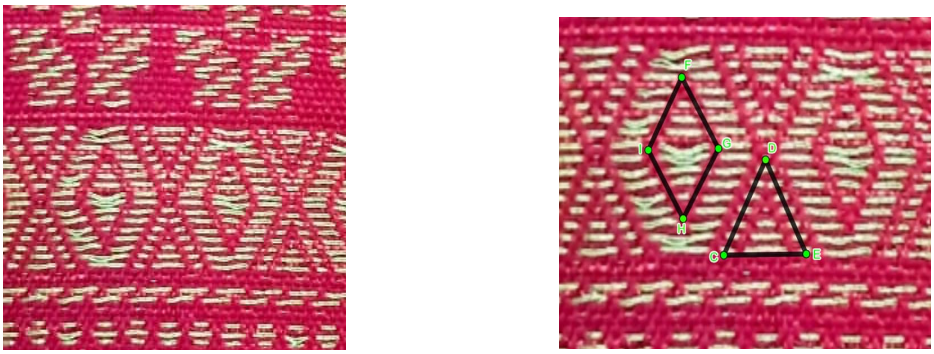

Figure 13. Sketch of Lepus Songket Cloth

From Figure 13, there are two motifs that can be measured. After measuring the gold thread and red thread that bind the pattern on the songket cloth, the researchers obtained the following measurements.

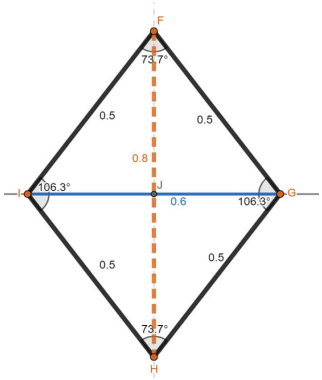

Figure 14. Motif Sketch 1

From the measurements carried out directly, the following dimensions were obtained.

Table 6. Size of Lepus Songket Cloth

Measurement results	**Size**
Many Sides	4 (FG, GH, HI, IF)
Side Length	FG = 0.5 cm, GH = 0.5 cm, HI = 0.5 cm, IF = 0.5 Cm
Angle Size	∠ F = 73.7 ° , ∠ G = 106.3 ° , ∠ H = 73.7 ° , ∠ I = 106.3 °
Diagonal Length	FH = 0.8 cm, GI = 0.6 cm
Point Diagonal Cut	FJ = HJ = 0.4 cm, GJ = IJ = 0.3 cm

Based on Table 6 , we can get some information about the Lepus songket cloth sect . flat that has four long side every opposite side Equal in length and four angles . Some characteristic typical from plane shape following is :

a). Same side Long : Fourth side rhombus has the same length . If long side is s , then fourth each side is s .
b). Opposite angles Equal in measure : Opposite angles in get up the own the same size that is $\angle F = 73{,}7°$face to face $\angle H = 73{,}7°$, And $\angle G = 106{,}3°$facing $\angle I = 106{,}3°$.
c). Diagonals intersect share upright straight : Internal diagonals the each other share upright straight and divide get up the become four equal right triangles big .
d). Symmetry : get up the own symmetry fold twice and symmetrical rotation twice (180 ° and 360 °).

So plane shape as shown in figure 14 is get up rhombus because fulfil conditions from rhombus. Rhombus is get up two-dimensional flat that has four same side length and two pairs of opposite angles Equal in measure . Shape rhombus often found around we and used in various application practical and theoretical.

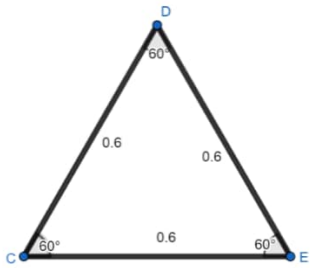

Figure 15. Sketch of Motif 2

From the measurements carried out directly, the following dimensions were obtained.

Table 7. Size of Lepus Songket Cloth

Measurement results	**Size**
Many Sides	3 (CD, DE, EC)
Side Length	CD = 0.6 cm, DE = 0.6 cm, EC = 0.6 cm
Angle Size	∠ ECD = 60 ° , ∠ CDE = 60 ° , ∠ DEC = 60 °

Based on Table 7 , we can get some information about the Lepus songket cloth sect . flat that has three long side every side The same length and angle Equal in measure . Some characteristic typical from plane shape following is :

a). Same side Long : third side get up the own the same length .
b). Specific angles : Angles all three Equal in measure .
c). Symmetry : The figure has rotational symmetry as much as three times (120 ° , 240 ° , and 360 °).

So plane shape as shown in figure 15 is plane shape equilateral triangle due to fulfil conditions from plane shape equilateral triangle . Equilateral triangle is triangle that has three same side long . Triangle This own a number of characteristic typical , including

equal sides possible lengths and angles Equal in measure If long his side The same .

Comparing the findings of this study with those of Syahriannur (2019), both studies confirm that songket cloth from the Sumatra region is rich in ethnomathematical content. Syahriannur identified geometric concepts such as trapezoids, rectangles, rhombuses, and circles in Minangkabau songket, while the present study reveals additional mathematical dimensions in Palembang songket, including number patterns (arithmetic sequences) and geometric transformations (reflection). This indicates that Palembang songket possesses a more diverse range of mathematical representations compared to those previously documented in Minangkabau songket. These findings have direct implications for mathematics education. The identification of familiar geometric shapes—such as parallelograms, hexagons, squares, rectangles, rhombuses, and triangles—within a culturally meaningful artifact provides teachers with contextual, locally rooted learning materials. Integrating Palembang songket motifs into classroom instruction can make abstract mathematical concepts more accessible and meaningful to students, particularly in regions where songket is part of the local cultural heritage. Furthermore, the presence of number patterns and reflective symmetry in songket motifs demonstrates that the artisans who created these designs possess an intuitive, practice-based mathematical knowledge that transcends formal schooling—a key insight of ethnomathematics as articulated by D'Ambrosio (2007). This cultural-mathematical knowledge can serve as a powerful bridge between students' lived experiences and formal mathematics curricula.

CONCLUSION

This study demonstrates that Palembang Lepus-type songket cloth is a rich repository of mathematical knowledge, embedding concepts of number patterns, geometric transformations (reflection), and plane geometry within its traditional motifs. The principal contribution of this research lies in providing empirical evidence of the presence of diverse mathematical structures—specifically arithmetic sequences and geometric figures including parallelograms, irregular hexagons, squares, rectangles, rhombuses, and equilateral triangles—within a culturally significant Indonesian textile. The study acknowledges several limitations: the analysis was restricted to a single type of songket (Lepus), the primary informant was limited to one museum curator, and the fieldwork period was relatively brief, which may limit the generalizability of the findings. For future research, it is recommended that studies explore a broader range of songket types and motifs from South Sumatra, include multiple craftsmen and cultural experts as informants, and investigate how ethnomathematics-based learning materials derived from songket motifs can be developed and implemented at various school levels. For educational practice, it is strongly recommended that teachers and curriculum developers incorporate songket motif analysis as a contextual learning medium in mathematics instruction, particularly for topics related to geometry, patterns, and transformations, as this approach aligns with the goals of culturally responsive and meaningful mathematics education.

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