







Translation as Method: From English Math to Cebuano-Visayan Math

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Abstract

Translation as method in teaching and in developing the cognitive skills of students in bilingual or multilingual environment has proven to be one of more effective ways of motivating students into having a fuller grasp of concepts behind terms Basols (2019). Narrative to this teaching method demonstrates the urgency of employing this strategy in Philippine State College of Aeronautics Mactan Campus in order to determine if translation does have a positive effect to student mathematical comprehension skills. This research found out that translation is a good tool in mathematics learning course as it aimed to enhance student's mathematical comprehension skills. Translating Mathematics terminologies from English to Cebuano Visayan is much useful as perceived by the 150 respondents. The dictionary on translation from English Math to Cebuano Visayan was

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presented as final output of this research. This dictionary will serve as reference by the technical students and teachers handling mathematics subjects.

Keywords: Cebuano-Visayan math, English math, Method, Translation

Introduction

Multilingual environment has been proven to be one of more effective ways of motivating students into having a fuller grasp of concepts behind terms Basols (2019). In countries where there is fundamental recognition of the needs of the student to understand basic concepts in their own language, the proficiency of students in many critical academic skills areas particularly in math and sciences, as shown by the Trends in International Mathematics and Science Study (TIMSS) of various schools, the need to look at the translation as species of teaching method and strategy cannot be underestimated (Education Counts, 2022).

Using translation is surely a natural and obvious means of teaching someone a new language. It has lots of good effects. It can be used to aid learning, practice what has been learned, diagnose problems, and test proficiency. In any case, teachers cannot stop students translating – it is such a fundamental basis for language learning (Oxford University Press ELT, 2011).

Translation is also useful skill in itself, and not just for professional translators and interpreters. In multilingual societies and a globalized world, translation is all around us as an authentic act of communication: from families, schools, hospitals, courts, and clinics to business meetings and the United Nations (Oxford University Press ELT, 2011).

This allows learners to relate new knowledge to existing ones, promotes noticing and language awareness, and highlights the differences and similarities between the new and existing language. Many people also find the tackling of translation problems intellectually stimulating and aesthetically satisfying. In addition, it helps create and maintain good

relations between teacher and student, facilitates classroom management and control, and allows students to maintain their own sense of first language identity, while also building a new bilingual identity. It does not seem to impede efficient language use; many students who began their studies through translation go on to become fluent and accurate users of the new language (Oxford University Press ELT, 2011).

In the case of a school which regards mathematics as a hand maiden to the other and succeeding professional courses, the need to translate is condition sine quo non to the equipping of the students of the knowledge and skills they used to develop professionally. In various accounts of Tirol and by the University of the Philippines Integrated School, such deliberate act of looking at translation as method has demonstrated the sharpening of the skills of students and their coming into a fuller understanding of abstracts concepts. The educational rule restates the obvious here: one learns from the familiar to the unfamiliar, from the known to unknown, the learning process is more productive in this way.

This study will give clarification on some mathematical terminologies and erase the barrier in understanding the terms as they are in the classroom instructions. This is an instrument for easy understanding on the mathematics lessons that serves as guide in the development of the word as they are translated from English math terminology to Cebuano Visayan Math, as commonly used by the professionals.

This work provides a narrative to this teaching as method and strategy and demonstrates the urgency as well of employing this strategy in Philippine State College of Aeronautics Mactan Campus. By documenting the processes used, the research exemplifies how translation has been made bear in the learning process of technical students in this school.

Significance of the Research

The significance of translating some of the mathematical terms is to ensure that learners have reference material which can be used to grasp

mathematical concepts and from which to source these mathematical terms. Grasping mathematical concepts and sourcing mathematics terminology is made easier through translation because the terms will now be translated in a language which is familiar to the student.

Research Objective

This research aimed to determine if translation does increase student's mathematical comprehension skills through the following specific research questions:

1. What is the level of Usefulness of Translating Mathematical Terminologies from English to Cebuano Visayan?
2. What are the problems encountered in the translation of English mathematical terminologies to Cebuano Visayan Mathematical Terminologies?
3. What is the extent of the Use of the Mathematical Terminologies in English and Cebuano?

Methodology

1. Subjects and setting

Participants of the study were the students and faculty handling mathematics subjects. The students were taking up Associate and Bachelor of Science in Aircraft Maintenance Technology. They were selected because they were the students of the researcher, and they can attest on how translation from English math to Cebuano Visayan math helps them in understanding the subject matter. There were five (5) faculty and 145 students from the Institute of Engineering and Technology were the participants of this study.

The study was conducted at the Philippine State College of Aeronautics Mactan Campus, Brigadier General Benito N Ebuena Air Base, Lapu-Lapu City where the researchers are employed.

2. Instrumentation and data collection procedure

The main tool use in this study was a questionnaire with 100 English mathematical terminologies with its translation from English math to Cebuano Visayan Math. The extent of the use of the math terminologies in English and Cebuano on the subject and the problems encountered of the participants on the translation were being asked.

After formal approval of the conduct of the research, administration of the questionnaires was done personally during their College Algebra classes. Clear instructions were given to the students on how to answer the questionnaire. 100 percent retrieval of the administered questionnaires was attained.

3. Data Analysis

The responses of the participants computed according to percentage and analyzed in terms of how often and how useful the translated English mathematical terms to Cebuano Visayan. The level of usefulness of translating mathematical terminologies from English math to Cebuano Visayan math were averaged from the mean of every statement with the range from 1.0-1.80 (Not Useful), 1.81-2.60 (Less Useful), 2.61-3.40 (Moderately Useful), 3.41-4.20 (Much Useful), and 4.21-5.0 (Very Much Useful). The problems encountered which shows the reactions of the participants on the translations were averaged from the mean of every statement with the range from 1.0-1.80 (Not Encountered), 1.81-2.60 (Less Encountered), 2.61-3.40 (Encountered), 3.41-4.20 (Much Encountered), and 4.21-5.0 (Very Much Encountered).

After getting the percentage, the words were ranked on how often the translated terms were used, analyzed and interpreted. The mean value on the problems encountered were ranked and interpreted.

Results and Discussions

The extent of the use of the mathematical terminologies in English and Cebuano is shown in Table 1. There are forty-six (46) mathematical terms or 46% which is in the very much used by the majority of the participants. They are: Addition, Algebra, Axiom, Binomial, Complex Fraction, Common Factor, Constant, Counting Numbers, Cube Root, Division, Exponent, Factorial, Factoring, Foil Method, Imaginary Number, Integer, Irrational Number, Least Common Denominator, Like Terms, Literal Coefficient, Lowest Term, Monomial, Multiplication, Numbers, Numerical Coefficient, Power, Prime, Perfect Square, Polynomial, Rational Number, Radical, Radicand, Real Numbers, Reciprocal, Root, Subtraction, Simplify, Term, Trinomial, Variables, Whole Numbers.

There are thirty-eight (38) terms or 38% are in the much-used term. They are: Abscissa, Absolute Value, Algebraic, Axis, Base, Binomial Expansion, Binomial Formula, Cartesian Plane, Cartesian, Coordinate, Coefficient, Conjugate, Discriminant, Determinant, Degree of Polynomial, Domain, Equation, Extraneous Root, Factor Theorem, Gauss-Jordan Elimination, Greatest Common Factor, Infinite Set, Integral, Index, Leading Coefficient, Least Common Multiple, Origin, Pascal Triangle, Quadrant, Quadratic, Rationalizing the Denominator, Repeating Decimal, Sequence, Series, Set, Synthetic Division, Terminating Decimals, Venn Diagram.

There are sixteen (16) terms or 16% which are in the moderately used term. They are Algorithm, Arbitrary Point, Consistent System of Equation, Cramer's Rule, Dependent System of Equation, Function, Inequality, Inconsistent System of Equation, Matrix, Ordinate, Parabola, Relation, Range, Scientific Notation, Subset, and Symmetry.

Data reveals that there are forty-six (46) mathematical terminologies in English-Cebuano terms are very much used in the class, thirty-eight (38) terms are much used and sixteen (16) terms are in the moderately used term. This means that there are more mathematical terminologies that are very much used by the teachers and students in a mathematics class.

Table 1*Extent of the Use of the Mathematical Terminologies in English and Cebuano*

English Mathematical Terms	Frequency	Percentage
1. Addition, Algebra, Asymptote, Axiom, Binomial, Complex Fraction, Common Factor, Compute, Constant, Counting Numbers, Cube Root, Division, Exponent, Factorial, Factoring, Finite Set, Foil Method, Imaginary Number, Integer, Irrational Number, Least Common Denominator, Like Terms, Literal Coefficient, Lowest Term, Monomial, Multiplication, Numbers, Numerical Coefficient, Power, Prime, Perfect Square, Polynomial, Rational Number, Radical, Radicand, Real Numbers, Reciprocal, Root, Subtraction, Simplify, Term, Trinomial, Variables, Whole Numbers.	46	46%
2. Abscissa, Absolute Value, Algebraic, Axis, Base, Binomial Theorem, Binomial Formula, Cartesian Plane, Cartesian Coordinate, Coefficient, Conjugate, Discriminant, Determinant, Degree of Polynomial, Domain, Equation, Extraneous Root, Factor Theorem, Gauss- Jordan Elimination, Greatest Common Factor, Infinite Set, Integral, Index, Leading Coefficient, Least Common Multiple, Origin, Pascal Triangle, Quadrant, Quadratic, Rationalizing the Denominator, Repeating Decimal, Sequence, Series, Set, Synthetic Division, Terminating Decimals, Venn Diagram.	38	38%

Table 1 (Continued)

English Mathematical Terms	Frequency	Percentage
3. Algorithm, Arbitrary Point, Consistent System of Equation, Cramer's Rule, Dependent System of Equation, Function, Inequality, Inconsistent System of Equation, Matrix, Ordinate, Parabola, Relation, Range, Scientific Notation, Subset, Symmetry.	16	16%

Level of Usefulness of Translating Mathematical Terminologies from English to Cebuano Visayan

The level of usefulness of translating mathematical terminologies from English to Cebuano Visayan is shown in Table 2.

In the very much useful category are the “topic is more understandable when it is translated” with a weighted mean of 4.5 and “It increases ones’ awareness on topics that needs in-depth explanation” with a weighted mean of 4.21.

In the much useful category are: “It provides a wide range of knowledge to both the students and instructors” with a weighted mean of 4.18, “It helps to motivate student to study harder” with a weighted mean of 3.88, “It increases the percentage of the result during examinations” with a weighted mean of 3.45, “It helps the students to use new knowledge” with a weighted mean of 3.75, “It helps to understand unfamiliar terminologies” with a weighted mean of 4.0, and It provides new knowledge” with a weighted mean of 3.96.

In the useful descriptive category is the increase of students’ willingness to learn math with a weighted mean of 3.0 and the usefulness to aid students’ learning with a weighted mean of 3.40.

The total mean average is 3.96 which are in the much useful category. Data reveals that the terms are very much useful when they are translated, they are more understandable and increases awareness on the topics that needs in-depth explanation. The terms are much useful as they provide a wide range of knowledge to both the students and instructors. The Cebuano terms helps to motivate students to study harder, use new knowledge, increases the percentage of the result during examinations, helps to understand unfamiliar terminologies, and provides new knowledge.

Table 2

Level of Usefulness of Translating Mathematical Terminologies From English to Cebuano Visayan

Indicators	Weighted Mean	Descriptive Category
1. The topic is more understandable when it is translated.	4.5	Very Much Useful
2. It provides a wide range of knowledge to both the students and instructors.	4.18	Much Useful
3. It increases ones' awareness on topics that needs in-depth explanation.	4.21	Very Much Useful
4. It increases students' willingness to learn math.	3.0	Useful
5. It helps to motivate student to study harder.	3.88	Much Useful
6. It increases the percentage of the result during examinations.	3.45	Much Useful
7. It is useful to aid students' learning.	3.40	Useful

Table 2 (Continued)

Indicators	Weighted Mean	Descriptive Category
8. It helps the students to use new knowledge.	3.75	Much Useful
9. It helps to understand unfamiliar terminologies.	4.0	Much Useful
10. It provides new knowledge.	3.96	Much Useful
TOTAL	3.96	Much Useful

The problems encountered in the translation of English mathematical terminologies to Cebuano Visayan Mathematical Terminologies

Table 3 shows the problems encountered in the translation of Mathematical Terminologies from English Math to Cebuano-Visayan Math with its weighted mean and descriptive category.

The problems that are much encountered are the words that has no translation from English Math to Cebuano Visayan Math which has a weighted mean average of 4.0 which ranked first, it reduces opportunity to the students/instructors to practice English which has a weighted mean of 3.88 which ranked second and students/instructors lose confidence in their ability to communicate in English which has a weighted mean of 3.51 which ranked third. The English words that have no translation to Filipino and Cebuano posed much difficulty to the students which needed to be addressed to. The problems that there is a problem in understanding term translated in Cebuano which has a weighted mean of 2.80 which ranked fourth and lessen students' ability to comprehend terms which has a weighted mean of 2.7 which ranked fifth. A problem that was less encountered was the topic is

more complicated when it is translated which has a weighted mean of 2.45 which ranked last.

This reveals there is a need to do some strategies to eradicate or lessen the problems encountered by the students at Philippine State College of Aeronautics in understanding mathematical terminologies.

Table 3

The Problems Encountered in Translating Mathematical Terminologies from English Math to Cebuano-Visayan Math

Problems Encountered	Weighted Mean	Descriptive Category	Rank
1. The topic is more complicated when it is translated.	2.45	Less Encountered	5
2. There are words that have no translation from English Math to Cebuano Visayan Math.	4.0	Much Encountered	1
3. It reduces opportunity to the students/instructors to practice English.	3.88	Much Encountered	2
4. Students/Instructors lose confidence in their ability to communicate in English.	3.51	Much Encountered	3
5. There is a problem in understanding term translated in Cebuano.	2.80	Encountered	4
6. Lessen students' ability to comprehend terms.	2.7	Encountered	6
TOTAL	3.22	Much Encountered	

Conclusions

It is hereby concluded that: among the one hundred translated mathematical terms:

1. Among the one hundred translated mathematical terms there are forty-six (46) mathematical terminologies in English-Cebuano terms which were very much used in the class, thirty-eight (38) terms are much used, and sixteen (16) terms are in the moderately used term. This means that there are more mathematical terminologies that are very much used by the teachers and students in a mathematics class.
2. Data reveals that the terms are very much useful when they are translated, they are more understandable and increases awareness on the topics that needs in-depth explanation. The terms are much useful as they provide a wide range of knowledge to both the students and instructors. The Cebuano terms helps to motivate students to study harder, use new knowledge, increases the percentage of the result during examinations, helps to understand unfamiliar terminologies, and provides new knowledge.
3. Much encountered problems are the words that have no translation to Cebuano Visayan Math, students/instructors lose confidence in their ability to communicate in English and difficulty in understanding terms. Less encountered problem is the topic of perception that the terms are more complicated when it is translated.
4. The respondents found positive reaction to the list of translated terminologies. This will contribute to the development of the mother-tongue and National Language in the K+12 Curricular Enhancement Framework.

Recommendations

Based on the results and discussions the following recommendations are herein given:

1. Submit the output of the research to the Research Office at the main campus for comments and suggestions and approval of the Academic Council, College President, and Board of Trustees for use of said dictionary.
2. Pursue with the application of the copyright and ISBN number for the said English-Cebuano Visayan Math.
3. Publish the research to the journals and magazines.
4. All teachers handling mathematics subjects will be called for a conference with the agenda of discussing the introduction of the translation of English Math to Cebuano Visayan Math. They will be oriented of the use of Cebuano Math in their subject for clarification on English terms not understood by the students.
5. The use of the English – Cebuano Mathematics Dictionary will be reproduced and made available to the instructors and students. It will be reproduced and put in the Production Department with the Income Generating Department for sale to the students and anybody who would buy.
6. Conduct further research on the topic to enrich the Dictionary of English Math to Cebuano Visayan Math.

Table 4*A Dictionary of Mathematical Terminologies with Translation from English Math to Cebuano Visayan Math*

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
1.	Abscissa/Absisa	the horizontal coordinate of a point in a plane coordinate system obtained by measuring parallel to the x-axis	ang pinahigdang abtanang a hawanang abot linya ng sistema ng makuha pinaagi sa pagsuko sa magkaparehang han-ay ngadto sa ihi sa x
2.	Absolute Value/Absolutong Kantidad	a nonnegative number equal in numerical value of the given real numbers	ang dili negatibong numero ktumbas sa dekanidad nga numero sa gihatag nga (tinuod) na numero
3.	Addition/Dugangan	the arithmetic operation of summing; calculating the sum of two or more numbers	ang pagsumada sa pagkuwenta sa duha o abaw pa ng mga numero
4.	Algebra/Alyebra	the mathematics of generalized arithmetical operations	ang matematika sa kabug-osang aritmetikong mga pamaagi

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
5.	Algebraic/Alyebrek	relating to, involving a finite number of repetitions of addition, subtraction, multiplication, division, extracting roots, and raising to powers	pagbahin-bahin, pagkuha sa linuganang ugat o pagpataas sa iyang gahom sa mamugnang kaugalingong numero
6.	Algorithm/Algoritmo	a procedure for solving mathematical problems	ang pamaagi sa pagsulbad sa problemang matematikal
7.	Arbitrary Point/ Puntong Arbitraryo	based on or determined by individual preference or convenience to serve its purpose rather than by its intrinsic nature	ang gi basihan sa gustong makab-ot nga kapilian kay sa iyang kinasulorang kinaiyahan
8.	Asymptote/Asemtote	A line or curve that the graph of a relation approaches more and more closely the further the graph is followed	Ang linya o kurba sag rap nga dunay kalabotan sa dugang pamaagi o mas duol nga pagsunod niini

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
9.	Axiom/Panultihon	maxim widely accepted on its intrinsic merit	panultihon sangkad nga gidawat sa iyang kinasulorang merito
10.	Axis/Ehe, Aksis	a straight line about which a body or geometric figure rotates or may be supposed to rotate	ang tul-id ng linya diin and mukuwentang mga pormang magpatuyok niini
11.	Base/Basi	a number that is raised to a power	ang numero nga mapalabaw pa sa iyang gahom sa iya mismong kantidad
12.	Binomial/Baynomiyal	a quantity expressed as a sum or difference of two terms; a polynomial with two terms	ang gidaghanong mapasundayag sa ingong sumada o kaha sa deperensiya sa duha ka hugpong o kaha

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
13.	Binomial Theorem/Teoremang Baynomiyal	a theorem giving the expansion of a binomial raised to a given power	us aka teoremang mohatag ug pagpalapad sa baynomiyal pinasaka sa gihatag nga gahom
14.	Cartesian Plane/Hawanang Cartesian	plane formed by a horizontal axis and a vertical axis, often labeled the x-axis and y-axis, respectively	ang hawanang naporma gikan sa pinahigdang ehe ug pinabarog nga ehe, nga kasagarang gi-anggaag ehe x ug ehe y
15.	Cartesian Coordinate/Sumpot Linyang Cartesian	either of two coordinates that locate a point on a plane and measure its distance from either of two- or straight-line axes along a line parallel to the other axes	bisan asa sa duhang abotanan nga mangita sap unto hawanan ug mosukod sa iyang gilay-on bisan sa asa sa duh aka tul-id nga linya sa ehe

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
15.	Cartesian Coordinate/Sumpot Linyang Cartesian	either of two coordinates that locate a point on a plane and measure its distance from either of two- or straight-line axes along a line parallel to the other axes	bisan asa sa duhang abotanan nga mangita sap unto hawanan ug mosukod sa iyang gilay-on bisan sa asa sa duh aka tul-id nga linya sa ehe
16.	Coefficient/Parehang Puslanon	a constant factor of term as distinguished from a variable	ang naandamang termino sa napaila gikan sa mga kapilian o baryabol
17.	Complex Fraction/Di-simpleng Tipik	a fraction which has a part of its numerator and/or denominator at least one other fraction	ang tipik nga adunay parti sa iyang nyumeritor o denomenyeter maski us aka laing tipik

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
18.	Common Factor/Komong Sab-oy	a factor that are common in a given terms	ang sab-oy nga maoy komon diha sa hinatag nga termino
19.	Compute/Pagkwenta	to figure out or evaluate	pagkwenta o pagsubay
20.	Conjugate/Pagkaluha	having features in common but opposite in signs	pagbaton ug pagkapareho apan magka-atbang nga mga senyas
21.	Constant/Pagpunay, Tapan	a number that has a fixed value and assumed not to change value in a given mathematical discussion	ang numerong dunay untoy nga kantidad ug gidahom nga dili mausab ang kantidad sa hinatag nga matematikal nga diskusyon
22.	Consistent System of Equation/Kanunay nga Sistema sa Talaid	coherent lines intersecting at one point	nagsubay nga linya nga mag-
23.	Counting Numbers/Numerong Maihap	naturals numbers which start at 1,2,3 so on and so forth	natural nga mga numero nga kasagarang maihap magsugod sa usa, duha, tulo hangtod sa gusting numero

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
24.	Cramer's Rule/Balaod ni Cramer	a method for solving a linear system of equations using determinants. It may only be used when the system is square and the coefficient matrix is invertible	ang pamaagi sa pagsulbad sa tudling sistema sa talaid ginamit ang mga numerong nagatumong. Kini magamit lamang kon ang sistema maoy kuwadro ug parehang puslanon
25.	Cube Root/Kuwadradong Ugat	A number that must be multiplied times itself three times to equal a given number	ang numero nga kinahanglan mapilo sa iyang kantidad mismo tulo ka pilo nga moresulta sa hinatag nga numero
26.	Discriminant/Numerong Ginatumong	a mathematical expression that provides a criterion for the behavior of another expression or relation	ang matematikal nga padayag nga maghatag ug sumbanan alang sa kinaiya alang sa laing padayag o kalambigitan

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
27.	Determinant/Numerong Nagatumong	a square array of numbers bordered on the left and right by a vertical line and having a value equal to the algebraic sum of all possible products where the number of factors in each product is taken from a different row and column	pinabarog nga linya nga dunay parehang alyebrek nga sumada sa tanang posibleng produkto diin ang numerong sab-oy kada usa makuha gikan sa nagkadaiyang linya o poste
28.	Dependent System of Equation/Nagdependeng Sistema sa Talaid	two coherent equations whose graphical solution coincide	duha aka nagsubay nga talaid nga magtakdo ang iyang grapikal nga solusyon
29.	Degree of a Polynomial/Degradong Polinomyal	the sum of the exponents of the variable's factors in the term of highest degree in polynomial	ang sumada sa eksponente sa mga kapilian sab-oy diha sa termino sa pinakahabog grading polinomyal

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
30.	Division/Pagbahin-bahin	operation that tells us the number of groups that can be made out of a number of items or the number of items that should be there in a group	ang pamaagi nga nagsugid kanato sa gidaghanon sa grupo nga mahimo gikan sa gidaghanon nga kinahanglan maanaa sa grupo
31.	Domain/Dominyo	the set of an element solution on which a function is defined or limited	ang plastada sa us aka elementong sulosyon nga ang kapusbuhat ingong limitado
32.	Equation/Talaid	a mathematical sentence built from expressions using one or more equal signs	usa ka matematikal nga tudling pulong namugnot gikan sa gipadayag ginamit ang usa o duha ka senyas
33.	Exponent/EkspONENTE	a symbol written above and to the right of mathematical expression to indicate the operation of raising to a power	ang simbolo nasulat ibabaw sa bahin sa matematikal nga padayag nga magtumong sa pamaagi sa pagpataas sa iyang gahom

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
34.	Extraneous Root/Ugat nga Ekstenyos	a number obtained in solving an equation that is not a solution to the equation	ang numerong mabatonan sa pagsulbad sa talaid
35.	Factor Theorem/Teoremang Pagsab-oy	a theorem that establishes the connection between the zeros and factors of a polynomial	ang teorima naestablisar may kalabotan diha sa pagkanulo ug pagsab-oy sa polinomyal
36.	Factorial/Pagsab-oy	the product of a given integer and all smaller positive integers	ang kinadak-ang intedyer nga angay nga pagkabahin ngadto sa kada usa nga hinatag nga hugpong o plastada sa numero
37.	Factoring/Pagbungkas	operation of resolving a quantity into factors	pamaagi sa paghusay sa kantidad sa mga pagsab-oy
38.	Finite Set/May Kinutubang Hugpong	a set whose elements are completely determinable or countable	usa ka huspong elemento nga kompletong mayhap o matagna

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
39.	FOIL Method/Pa managing FOIL	a technique for distributing two binomials	usa ka pamaagi sa paghatag ug duha ka baynomiyal
40.	Function/Kapusbuhat	a mathematical correspondence that assigns exactly one element of another set	ang matematikal nga tubaganay nga eksaktong gidihogan sa usa ka element o laing hugpong
41.	Gauss-Jordan Elimination/Paghawan ni Gauss-Jordan	a method of solving a linear system of equations	ang metodo o pamaagi sa paghusay sa linyang sistema sa talaid
42.	Greatest Common Factor/Kinadak-ang Komong Sab-oy	the largest integer that divides evenly into each of a given set of numbers	ang kinadak-ang intedyer nga angay nga pagkabahin ngadto sa kada usa nga hinatag nga hugpong o plastada sa numero
43.	Inequality/Di pagkapatas	a mathematical sentence built from expressions using one or more of the symbols $<$, $>$, \leq and \geq	ang matematikal nga tudling pulong gihugna gikan sa gipadayag ginamit ang usa ug duha nga mga simbolo sama sa $<$, $>$, \leq and \geq

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
44.	Infinite Set/Way Kinutubang Hugpong	a set which is inconceivably extensive, extending beyond	usa ka plastada o hugpong kon diin dili madawat ang sobra ug makanunayon
45.	Imaginary Number/Gihunahunang Numero	the positive square root of minus one denoted by I or $+\sqrt{-1}$	ang positibong kuwadradong ugat kinuhaan ug usa gipasiugda pinaagi ug I or $+\sqrt{-1}$
46.	Integer/Intedyer	any of the natural numbers, its negatives and zero	bisan asa sa kinaiyanhong numero sa iyang negatibong pagkanulo niini
47.	Irrational Number/Dikatuohang Numero	nonrepeating and nonterminating number which cannot be expressed as a ratio such as $\sqrt{2}$	dili binalik ug dili talitapos nga numero kon diin dili mapadayag ingong kaamgiram sama sa $\sqrt{2}$

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
48.	Integral/Integral	being, containing, or relating to mathematical integers	pagkahimo, pagbaton o may kalambigitan sa matematikal nga mga intedyer
49.	Index/Indise	a number that indicates the value of the radicand or the n^{th} root of a number	ang numero nga nagtumong sa kantidad sa radikan o sa n^{th} ugat sa numero
50.	Inconsistent System of Equation/Di-Parehang Sistema sa Talaid	a system of equation whose graphical solutions does not intersect or has no common point. The lines are parallel to each other	dili-kanunay nga pareha sa talaid kinsang grapikal nga kasulbaran wala mag-abot o walay kumong punto. Ang mga linya nag-ambihias sa usag-usa

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
51.	Leading Coefficient/Nag-unang Parehang Puslanon	the coefficient of a polynomial's leading term	ang pakas, sa usa ka nag-unang termino sa polinomiya
52.	Least Common Denominator/Kinagamyang Komong Denominaytor	the smallest whole number that can be used as denominator for two or more fractions	ang pinakagamay nga tibuok numero nga mahimong gamiton ingong denominaytor alang sa duha o
53.	Least Common Multiple/Kinagamyang Komong Daghanon	the smallest positive integer into which two or more integers divide evenly	ang pinakagamay nga positibong intedyer ingong duha o daghang intedyer mabahin sa maayong pagkaangay
54.	Like Terms/Magkaparehang Termino	terms which have the same variables and corresponding powers and/or roots	mga terminong adunay parehang kapilian o baryabol ug sa kadaiyang gahom o ugat daghang tipik niini
55.	Literal Coefficient	any variable in an algebraic expression	bisan unsang baryabol sa usa ka alyebrek nga ekspresyon

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
56.	Lowest Term/ Pinakagamay nga termino or numero	the form of a fraction in which the numerator and denominator have no factor in common except 1	ang porma sa usa ka tipik diin ang nyumeritor ug denominaytor walay butang nga managsama gawas sa 1
57.	Logarithm/Logaritmo	the logarithm base b of a number x is the power to which b must be raised in order to equal x	ang logaritmong gigikanang b sa us aka numero x ang iyang gahom kon diin ang b kinahanglan maisaka aron mahimong kaamgid sa x
58.	Matrix/ Kuwentahonong plastada o banig	a rectangular (or square) array of numbers	ang pataas kuwadro sa naglinyang mga numero
59.	Monomial/Monomiyal	a polynomial with one term	ang polinomiya kauban sa us aka termino
60.	Multinomial/ Multinomiya	a polynomial with three or more terms	ang aritmitik nga pamaagi nga maoy katumbas sa pagbahin-bahin

Table 4 (continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
61.	Multiplication/Pagpilo-pilo/Pagdoble	an arithmetic operation that is the inverse of division	ang aritmetik nga pamaagi nga maoy katugbang sa pagbahin-bahin
62.	Number Line/Linyang De Numero	a line representing the set of all real numbers	: ang linya nga nagpasiugda sa hugpong sa tanang tataw nga numero
63.	Numerical Coefficient/Numerong Magkatugma	the constant multiplicative factors attached to the variables in an expression	ang pagpunay sa dinobleng pagsab-oy nga tapot sa baryabol sa us aka padayag
64.	Ordinate/Baruganos	the Cartesian coordinate obtained by measuring parallel to the y-axis	ang sumpayang punto nga Cartesian nabatonan pinaagi sa pagsukod sa nag-ambahas sa y nga aksis
65.	Origin/Sinugdanan	the intersection of coordinate axis	ang abotanan sa abot-punto sa aksis o ehe

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
66.	Parabola/Halitok	the sum of the exponents of the variable's factors in the term of highest degree in polynomial	ang sumada sa sabnumero sa mga kapiliang sab-oy sa terminong pinakataas ang punto-grado sa polinomiya
67.	Pascal Triangle/Tuloysuok ni Pascal	a pattern to get the numerical coefficient of a given binomial which is particularly found by adding the two numbers that are above and on either side of the element	a naandamang paagi aron sa pagkuha sa numerong parehang puslanon sa hinatag nga baynomiya nga kanunay makit-an pinaagi sa pagdugang ug dula ka mga numero nga taas bisan asa sa ilang kilid sa element
68.	Power/Gahom	the number of times as indicated by an exponent that a number occurs as a factor in product, or the product itself	ang gidaghanong gipilo nga giindikar sa usa ka eksponente nga ang numero o ang produkto mismo

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
69.	Prime/Primero, Panguna	having no polynomial factors other than itself and no monomial factors other than 1	wala nagbaton ug polinomiya nga pangsab-oy nga dili sa iyang kaugalingon ug walay monomiya nga pangsab-oy walay lain gawas sa 1
70.	Perfect Square/Eksaktong Kuwadro	a number made by squaring a whole number	ang numerong nahimo pinaagi sa pagkuwadro sa tibuok numero
71.	Polynomial/Polinomyal	the sum or difference of terms which have variables raised to positive integer powers and which have coefficients that maybe real or complex	ang sumada o kalainan sa termino nga adunay kadaiyang ipasaka sa positibong intedyer nga mahimong magkapareha
72.	Quadrant/Pagkaupat nga Bahin	any of the four parts into which a plane is divided by a rectangular coordinate axes lying in that place	bisan asa sa ika-upat nga bahin nga ang hawanan nabahin sa usa ka taas-kuwadro nga nadugtong nga akses diha sa iyang nahimutangan

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
73.	Quadratic/Pagkaupat-upat	involving terms of the second degree with parabolic graphical solutions	naglambigit sa terminong ikaduhang ang-ang diha sa pinalingin o halitok grapikal nga soluyon
74.	Rational/Katuohang Numero, Rasyonal	can be expressed as ratio	ang mahimong ipasiugda ingong kalambigitan o may pagkasamo
75.	Radical/Radikal	An expression that has a square root, cube root, etc	ang padayag nga dunay kuwadrong ugat, kahong ugat ug uban pa
76.	Radicand/Radikan	the quantity under the radical sign	ang gidaghanon ubos sa radikal nga simbolo
77.	Rationalizing the Denominator/Pagtukib sa Denominaytor	the process by which a fraction is written so that the denominator contains only rational numbers	ang proseso kon diin ang tipik masulat aron ang komong numerong pang-ilawom o denomineytor na-undan lamang sa matukib nga numero
78.	Real Numbers/Tataw nga Numero	consist of the natural numbers, whole numbers, integers, rational, and irrational numbers	nagbaton ug kinaiyanhong numero, numerong tibuok, intedyer

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
79.	Reciprocal/Resiprokal	the multiplicative inverse of a number which when multiplied by the number is equal to one	ang paabanteng pagdoble sa usa ka numero nga kon idoble sa maong samang numero maoy katumbas sa usa
80.	Relation/Kalambigitan	an aspect that connects two quantities as belonging together	ang aspeto nga naglambigit a duha ka gidaghanon ingong samang naghugpong
81.	Range/Talay	the set of admissible values for the second component of an ordered pair, a function may take on	ang gitakda sa dalawatong kantidad alang sa ikaduhang bahin sa nagsunod nga paris, and paghimo niana mahimo alang sa kapuslanan sa buhat
82.	Repeating Decimal/Balik-balik nga Gutling	A decimal number that has digits that repeat forever	ang gutling o decimal nga dunay gintang nga hangtod sa hangtod magbalik

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
83.	Root/Gamot	a number that reduces an equation to an identity when it is substituted for one variable	ang numerong mapagamyan sa talaid nga mailhan kon kini pulihan ug usa ka baryabol o kapilian
84.	Scientific Notation/Siyentipikanhong Notasyon	a method of writing or displaying numbers in terms of a decimal number between 1 and 10 multiplied by a power of 10	ang pamaagi sa pagsulat o pagbutang sa mga numero sap unto sap
85.	Sequence/Pagkahan-ay	a list of numbers or objects in a special order	ang listahan sa mga numero o butang nga espesyal nagsunod-sunod
86.	Series/Serye	a number of objects or events arranged or coming one after the other in succession	ang gidaghanon sa mga butang o nahitabo nga nahan-ay o ang pagabot sa usa human sa usa nga nagsunod-sunod

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
87.	Set/Hugpong	a number of things of the same kind that belong or are used together	ang gidaghanong sa mga butang nga parehag kaamgiran nga magamit nga Dungan
88.	Simplify/Pagpayano	to make simpler	paghimong yano niini
89.	Special Product/Produktong Espesyal	the process of combining factors to form products	ang proseso sa pagtapo sa mga sab-oy sa pagporma ug mga produkto
90.	Subset/Ubos huspong	a set whose elements are elements of an inclusive set	ang hugpong kansang element maoy samang element sa iyang kaugalingong hugpong
91.	Subtraction/Pagkakunhod, Pagpamenos	is a mathematical operation that represents the operation of removing objects from a collection	ang matematikal nga pamaagi nga nagsilbing pamaagi sa pagkuha sa mga butang gikan sa han-ay tipig o koleksyon

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
92.	Simplify Terms/Pagpayano sa Termino	to make terms simpler	Pagpayano o paghimong yano sa termino
93.	Symmetry/Pagkaangay	property of a graph having a balanced proportion with respect to size, shape, and position of parts on opposite sides; the dividing line about its axis	kinaiya sa usa ka daghang kuwadro o grap nga nagbaton ug balanseng pagkaangay sa iyang gidak-on, porma o kahimtang sa iyang mga bahin sa atbang porma o kahimtang sa iyang mga bahin sa atbang kiliran, mabahin nga linya sa iyang kaugalingong aksis o ehe
94.	Synthetic Division/Sintitikong Pagbahin-bahin	a method of performing polynomial long division, with less writing and fewer calculations	ang pamaagi sa pagbuhat ug taas nga pagbahin sa polinomyal nga dunay menos nga pagsulat ug menos nga pagkuwenta

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
95.	Term/Termino	is either a single number or variable, or numbers and variables multiplied together	kini maoy usa o kapilian, o mga numerong kapilian gidungan ug pilo-pilo
96.	Terminating Decimals/Talitapos nga Gintang	the multiplicative inverse of a number which when multiplied by the number is equal to one	ang paabanteng pagdoble sa usa ka numero nga kon idoble sa maong samang numero maoy katumbas sa usa
97.	Trinomial/Traynomiyal	A polynomial with three terms	ang polinomiyal nga dunay tulo ka termino
98.	Variable/Kapilian	symbols that are used to represent unspecified numbers	ang mga simbolo nga gamiton sa pagpasiugda ug dili espisipikong numero

Table 4 (Continued)

No	Terminologies in English/Cebuano	Meaning in English Translation	Meaning in Cebuano Translation
99.	Venn Culumn/Poste ni Venn	a straight horizontal mark placed over two or more members of a compound mathematical expression as $a - b + c = a - (b + c)$.	Usa ka deretsong pinahigdag marka nabutang sa ibabaw sa duha o daghang numero diha sa nagdobleng matematikal nga ekspresyon sama sa $a = b +$
100.	Venn Diagram/Diagram ni Venn	a graph that employs closed curves like circles to represent logical relations between sets and their operations	ang daghang kuwadro o grap nga migamit ug siradong kurbang samag 38istem nga nagkahulogan lohikal nga kalambigitan sa duha ka hugpong ug sa ilang pamaagi

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