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CONTRIBUTION OF PREREQUISITE MATERIALS AND CREATIVE THINKING TO THE ABILITY OF SOLVING LOGARITHM PROBLEMS AT SMK NEGERI 4 MEDAN

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ABSTRACT

The problem in this study is how the mastery of students in exponentiation and root to the ability of students in solving problems of logarithms whether there is a contribution of exponentiation and root on students' ability to solve logarithmic problems.
The purpose of this study is to determine the mastery of students in exponentiation and root on students' ability to solve logarithmic problems, to find out whether there is a contribution of exponentiation and root on students' logarithmic learning outcomes and to find out how much the contribution of mastery of exponentiation and root on students' logarithmic learning outcomes.
The method of this research was descriptive. As the population of this research was the students of SMK N 4 Medan Class X which were 123 people. The sampling technique used a sample of 25% which was 30 people. The research instrument used was an objective test which consisted of 40 questions.
From the results of this study, the data obtained on the proficiency of the students in learning mathematics on the subject of exponentiation and root (variable x) resulted in an average value of 6.93 and a standard deviation of 1.32. While the results of the students' learning in solving logarithmic problems (variable y) resulted in a mean value of 6.92 and a standard deviation of 1.49.
Pearson's Product Moment Correlation statistic was used to test the hypotheses. The normality and linearity tests were calculated prior to hypothesis testing. From the results of the analysis it was found that the sample was normally distributed and had a linear regression shown by the equation y = 4.83 + 0.301 x r criticism, which is by comparing the value of rcount with the value of rtable with a real level of $\alpha = 0.05$. The value r = 0.27 is obtained from the calculation. This value is greater than the table for n = 30 students of 0.03. Therefore, Ho is rejected and Ha is accepted, which means that there is an effect of students' mastery of exponentiation and root on students' ability to solve logarithmic problems in Class X SMKN 4 Medan.

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1. INTRODUCTION

National education functions to develop abilities and shape the character and civilisation of a dignified nation in order to educate the nation's life, aims to develop the potential of students to become human beings who are faithful and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens (Law Number 20 of 2003). Education that is able to support future development is education that is able to develop the potential of students, so that they must be able to apply what they learn at school to face problems faced in daily life today and in the future.

Mathematics as one of the fields of study taught at every level of education has a very important and dominant role in educating students by developing the ability to think logically, critically, deductively and is further expected to support national education goals, so that the formation system can be absorbed and can keep up with technological advances.

One of the cognitive components of students that support their success is the ability to think creatively. Creative thinking patterns are very important in learning mathematics so that it can make it easier for students to solve problems in mathematics (Palobo, 2015: 75). According to Johnson (in Waluyo and Mintohari, 2013: 02) creative thinking is a mental activity that fosters original ideas and new understandings. Creative thinking always starts from critical thinking, in order to find or produce something that did not exist before or improve something.

In general, creative thinking is indeed a mental activity where a person can build new ideas from anything in his mind or memory such as ideas, information, concepts, knowledge, and experience. Creative thinking is a process of thinking that can make a person create new ideas, and creativity is the result or product of creative thinking. According to Silver (in Ismara, et al, 2017: 02) indicators to assess students' creative thinking skills refer to fluency, flexibility and novelty. Creative thinking is one of the abilities that is needed by students to welcome an increasingly modern life in the era of globalisation in facing challenges and competition.

According to Suwarsono (1987; 23) that:

"Factors that affect learning mathematics, factors that affect learning cognitive mathematics in addition to general knowledge (intelligence) deductive reasoning ability (deductive reasoning) and, mastery ability (Natural Corionaty)".

The decline in student learning achievement is because in learning students do not fully learn and master every concept or every subject matter of a lesson so that in mastering a lesson only fragments are not systematic, especially in the field of mathematics.

Learning mathematics starts from simple concepts to proceed to more complex concepts. When going to learn the next topic, the previous topic must be mastered first, because the requirement to be able to continue learning to the next topic is to master the previous topic. Learning mathematics must be gradual and structured starting from simple things to continue to complex things.

The ability to learn mathematics is not just memorising as a mechanism that lacks understanding, but knowledge in order to expect understanding, for example, the ability to master exponentiation and square root is very important, because exponentiation and root withdrawal are the basis of logarithm problems, meaning that exponentiation and root withdrawal are prerequisites for learning, mastering and understanding logarithm lessons.

Exponentiation is a mathematical operation, written as bn, involving two numbers, the base b and the exponent or power n, and pronounced as "b (raised) to the (power of) n". Whereas logarithm is the inverse (opposite) of multiplication, which is to find the power of a base number so that the result is in accordance with what is already known (Husein Tampomas, 2006: 11). From the definition of logarithm described above, logarithm is the inverse of exponent. So that logarithm material has a relationship with exponent material..

Learning the subject of logarithms, a student must first understand exponent material. Mastery of exponent material is required before learning the subject matter of logarithms. This means that exponent material is one of the prerequisites for learning logarithms, so exponent material is given in SMK class X first semester in the discussion before logarithm material. According to Ruseffendi (2006: 152) states that: Higher level mathematical concepts cannot be better understood, before understanding the previous concept well. In mathematics, every concept is related to other concepts. Likewise, between others, for example between postulates with postulates, between theories with theories, between topics with topics and between branches of mathematics.

This is supported by the theory of connectionism discovered and developed by Edward L. Thorndike, that learning must be by association (Muhibbin Syah, 2003: 92). The connection means the connection between the lessons that have been learnt and those that will be learnt by students. The stronger the link, the stronger the influence of the concept to be taught with the previous one. According to Wina Sanjaya (2010: 117) states that: An important concept of Thorndike's connectionism learning theory is what is called transfer of training. This concept explains that what children learn now must be used for other things in the future. Therefore, the concept that is taught must be related to the concept that has been understood.

Based on the experience of the Mathematics teacher in class X of SMK Negeri 4 Medan, Mr Drs Lisanuddin, it was often found that students have difficulty in solving logarithm problems because they did not master the material of multiplication and roots. The author found a problem in learning mathematics at SMK Negeri 4 Medan that has not emphasised the relationship between one material and another. Especially on the subject matter of multiplication, roots and logarithms.

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After the explanation above, the author is interested in conducting research on the title chosen by the author is "Contribution of Conditional Materials and Creative Thinking to the Ability to Solve Logarithm Problems at SMK Negeri 4 Medan".

2. METHODOLOGY

The research was conducted in SMK Negeri 4 Medan in the academic year 2004/2005. It started from July to September 2004. The population in this study were all students of Class X SMK Negeri 4 Medan with a total of 123 students. Of the total population, the sample selected was 25%, which was 30 people. The variables in the study were divided into two, independent variables (X) and dependent variables (Y). The independent variable in this study is the students' mastery in learning mathematics on the subject of exponentiation and root extraction. While the dependent variable is the students' ability to solve logarithmic problems. The research instrument used is an objective test with a total of 40 questions divided into two materials, that is, 20 questions on the subject of exponentiation and root extraction and 20 questions on logarithms. The data analysis steps are as follows:

1. Determining the mean and standard deviation of each variable X and Y (Sudjana, 1992 : 67) :

$$X = \frac{\sum f1.x1^2}{n(n-1)} \; dan \; Y = \frac{(\sum f1x1)^2}{n(n-1)}$$

By standard deviation (Sudjana, 1992 : 95)

$$S_x = \sqrt{\frac{n\sum f1xi^2 - (\sum fixi)^2}{n(n-1)}}$$

$$S_y = \sqrt{\frac{n\sum f1xi^2 - (\sum fixi)^2}{n(n-1)}}$$

Description:
X = Mean of variable x
Ȳ = Mean of variable y

2. Normality Test (Sudjana. 1992 : 466)

The normality test is used to see whether the samples taken from each skill come from a normally distributed population or not. The steps are as follows:

a. For these standardised numbers and using the standard normal distribution list, the probability is then calculated:
$F(zi) = P(z < zi)$
b. Then the proportion of $z_1, z_2, \dots, z_n$ that are less than or equal to z_i. If this proportion is stated by $S(z_i)$, then

$$S(zi) = \frac{number\ of\ z1, z2, \dots, zn\ that\ \le zi}{n}$$

c. Calculate the difference $F(z_i) - S(z_i)$ then determine the absolute value.
d. The largest absolute value of all solutions obtained is the price L0, compare it with Lt (α, n) under the condition that the sample population is normally distributed. If L0 ≤ Lt (α, n).

3. Homogenity Test (Sudjana, 1980 : 163)
To determine the homogeneity of the data studied, the Barlet test was used because with this test, testing was directly carried out for three data sets. The steps are as follows:
a. Writing Ho : $\sigma_1^2 = \sigma_2$
b. Calculating the variance of each variable (S^2i)
c. Calculating the combined variance with the formula:

$$S = \frac{\sum(ni-1)S^2 i}{\sum(ni-1)}$$

Calculating the unit cost of B (Barlet) with the formula:

$$B = (logs^2)\sum(ni-1)$$

d. With dk = k-1, k is the number of variables and ꝏ = 0.05. Reject the H_0 if $X^2 \ge X^2_{(1-ꝏ)(k-1)}$

4. Determining the linear regression equation (Sudjana, 1992 : 315)
Y = a + bx
The regression coefficient formula for a and b is:

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$$a = \frac{(\sum Y_1)(\sum Y_i^2) - (\sum X_i Y_i)}{n \sum X_i^2 - (\sum X_i)^2}$$

$$b = \frac{n \sum X_i Y_i - (\sum X_i) - (\sum Y_i)}{n \sum X_i^2 - (\sum Xi)^2}$$

5. Regression Linearity Test

Sumber Varians	DK	JK	KT	F
Total	N	$\sum Y_i^2$	$\sum Y_i^2$	-
Regression (a) Regression (b/a) Residue	1 1 n – 2	$\frac{(\sum Y_i^2)}{n}$ Jk_{res} = (b/a) $Jk_{res} = \sum(Y_{i-}Y_i^2)$	$\frac{(\sum Y_i^2)}{n}$ S^2_{reg} = JK (b/a) $Jk_{res} = \sum(Y_{i-}Y_i^2)$	$\frac{S^{2reg}}{S^{2res}}$
Tuna match Errors	k – 2 n – k	JK (TC) JK (E)	JK (TC) JK (E)	$\frac{S^{2TC}}{S^{2}e}$

a.

$$JK(E) = \sum_x \left\{ \sum Y_i^2 - \frac{(\sum Yi)^2}{n_i} \right\}$$

b.

$JK(b/a) = b\{\sum X_i Y_i - \frac{(\sum X_i)(\sum Y_i)}{n}\}$

c. $JK_{res} = \sum Y_i^2 - \frac{(\sum Yi)^2}{n} - JK(\frac{b}{a})$

d. JK (TC) = JK_{res} –JK(E)

If α = 0.05 with dk numerators k-2 and dk denominators nik obtained $F_{table} = F_{(1-\alpha)(k-2, n-k)}$ to test the linearity $F_{count} < F_{table}$ that the hypothesis is accepted.

6. Determining Hypothesis Test

$$r_{xy} = \frac{n \sum XiYi - (\sum Xi)(\sum Yi)}{\sqrt{\{n(\sum X_i{}^2) - (\sum X_i)^2\}(n(\sum Y_i{}^2) - (\sum Y_i)^2)}}$$

To test the hypothesis of this study, the meaningfulness of the correlation coefficient was tested using a significant statistical test, with the formula from Sudjana (1992:380) :

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

The hypothesis being tested is:
$H_O = \rho = 0$

$Ha = \rho \neq 0$

For real level α : 5% then the null hypothesis is accepted, if $-t_{(1-1/2\ \alpha)} < t < t_{(1-1/2\ \alpha)}$ in other cases H_O is rejected, accepted the t distribution used has dk = n-2. Whereas to find how much the contribution between the two variables used is the determination test with the formula:

$D = r^2 \times 100\%$

In which

$$r^2 = \frac{b(n \sum XiYi) - (\sum Xi)(\sum Yi)}{n \sum Y_i^2 - (\sum Yi)^2}$$

Description:

r_{xy}	: correlation coefficient between variable x and variable y
n	: sample size
xy	: multiplication of x and y variables
x	: independent variable

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y : dependent variable
$(\sum x)^2$: square of the sum of the x scores
$(\sum y)^2$: squared sum of y scores

3. RESULT AND DISCUSSION

After distributing the research instruments to students, the following are the test results related to students' abilities on the subject of exponentiation and roots and logarithms.

Table I
Students' Mathematics Learning Achievement on the Subject of Exponentiation and Roots and Logarithms

No	X_1	X_2^2
1	7	49
2	9	81
3	9	81
4	5	25
5	4	16
6	8	64
7	7	49
8	7	49
9	6,5	42,5
10	6,5	42,5
11	8	64
12	4	16
13	8,5	72,5
14	9,5	90,25
15	9,5	90,25
16	4	16
17	7	49
18	5	25
19	8,5	72,5
20	6,5	36
21	6,5	36
22	7	49
23	6,5	36
24	8	64
25	7	49
26	6,5	42,25
27	5	25
28	7	49
29	7,5	56,25
30	7,5	56,25
	208	492,25

No	X_1	X_2^2
1	6,5	42,25
2	9	81
3	7	49
4	6	36
5	7	49
6	4	16
7	8	64
8	8	64
9	7	49
10	7	49
11	7,5	56,25
12	7	49
13	9	81
14	7,5	56,25
15	8,5	72,25
16	9	81
17	4	16
18	5	25
19	8,5	72,25
20	8,5	72,25
21	8	64
22	5	25
23	6,5	42,25
24	7	49
25.	6	36
26.	7	49
27.	5	25
28.	4	16
29.	7,5	56,25
30.	7,5	56,25
	207,5	1499,25

From the table above obtained:

N= 30
$\sum X_1$= 208
$\sum X_1^2$= 1492,25
$\sum Y_1$= 207,5
$\sum Y_1^2$= 1499,25

From the table above, the average student learning achievement on the subject of exponentiation and root was obtained.

$\bar{X} = \frac{208}{30} = 6{,}93$

with the standard deviation being

$$S^2 = \frac{N\sum X_1^2 - (\sum X0)^2}{N(N-1)}$$
$$= \frac{30(1492{,}25) - (208)^2}{30(30-1)}$$
$$= \frac{447675 - 43264}{870}$$
$$= \frac{1503{,}5}{870}$$
$$S^2 = 1{,}73$$
$$S = 1{,}32$$

While the data on students' mathematics achievement on the subject of logarithms obtained the average is

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$\bar{Y} = \frac{207,5}{30} = 6,92$

With standard deviation being

$S^2 = \frac{N\sum Y_1^2-(\sum Y_1)^2}{N(N-1)}$

$= \frac{30(1499,25)-(207,5)^2}{30(30-1)}$

$= \frac{44977,5-43056,25}{870}$

$= \frac{1921,25}{870}$

$S^2 = 2,21$

$S = 1,49$

A. Testing the Analysis Requirements

Table II

Normality Test of Student Achievement on the Subject of Exponentiation and Roots

No	X_1	F_1	Fk	Z_1	$F(Z_1)$	$S(Z_1)$	$F(Z_1)$-$S(Z_1)$
1	4	3	3	-2,22	0,0132	0,1	0,0868
2	5	3	6	-1,46	0,0721	0,2	0,1279
3	6,5	6	12	-0,33	0,3707	0,4	0,0293
4	7	7	19	0,05	0,5199	0,63	0,1101
5	7,5	2	21	0,43	0,6664	0,7	0,0336
6	8	3	24	0,8	0,791	0,8	0,009
7	8,5	2	26	1,19	0,883	0,87	0,013
8	9	2	28	1,57	0,9418	0,93	0,0118
9	9,5	2	30	1,95	0,9744	1	0,0256

To test normality is carried out with the Liliefors test, wherein

Total sample (n) = 30 orang
Average Score ($\bar{X}$) = 6,93
Standard deviation (S) = 1,32
L_o from calculation = 0,1279
L table with λ = 0,187
then L_o (Ltabel = 0,1279 (0,161)

Therefore, the students' learning achievement on the subject of exponentiation and roots comes from a normally distributed population. The next step in this study is to test the normality and homogeneity of the variance of each of the following data:

1. Normality Test

The normality test of student achievement on the subject of exponentiation and root used the Liliefors test as shown in the following table.

Table III

Normality Test of Student Achievement on the Subject of Logarithms

No	X_1	F_1	Fk	Z_1	$F(Z_1)$	$S(Z_1)$	$F(Z_1)$-$S(Z_1)$
1	4	3	3	-1,96	0,025	0,1	0,075
2	5	3	6	-1,29	0,0985	0,2	0,1015
3	6	2	8	-0,62	0,02676	0,27	0,0024
4	6,5	2	10	-0,28	0,3897	0,73	0,0597
5	7	7	17	0,05	0,5199	0,57	0,0501
6	7,5	4	21	0,39	0,6517	0,7	0,0483
7	8	3	24	0,72	0,7642	0,8	0,0358
8	8,5	3	27	1,06	0,8554	0,9	0,0446
9	9	3	30	1,40	0,9192	1	0,0808

From the list above Lo = 0.1015, with n = 30 of the real level 0.01 from list XIX (II) obtained Ltabel = 0.187 which is greater than Lo = 0.1015. Therefore, students' learning achievement on the subject of logarithms comes from a normally distributed population.

2. Homogeneity Test

The homogeneity test of mastery of exponentiation and root on solving logarithm problems used Barlett's test as shown in the following table:

Table IV

Homogeneity Test

No	Dk (n-1)	1/dk	S_1^2	LogS_1^2	Dk log S_1^2
1	2	3	4	5	6
1 2	29 29	1,32 1,49	1,32 1,49	0,12 0,17	3,48 4,93

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Total	**58**	0,06	-		8,41

From the table above, the combined variance is obtained, that is:

$S_1^2 = \frac{(n_1-1)S_1^2+(n_2-1)S_1^2}{(n-1)}$

$= \frac{29(1,32)+29(1,49)}{58}$

$= \frac{38,28+43,21}{58}$

$= \frac{81,49}{58}$

$= 1,405$

thus log S^2 = log 1,405 = 0,148, obtained

B = (log bS^2)(n-1)

= (0,148)(58)

B = 8,584

The Barlett Test is as follow:

X^2 = (In 10) {B-∑(n_1-1)S_1^2 + (n_2-1)S_1^2}

= (2,3026)(8,584-8,41)

= (2,3026-0,174)

= 2,129

If λ=0,05 with dk=1, this distribution list is squared as seen in the attachment, X^2 0,99(1)=6,63 is obtained X^2 count<x table or it can be stated that the variance of the two data above is homogeneous.

3. Linearity Test

In order to determine whether there is a relationship between variables X and Y by using linear regress Y=a+bx. The determination of the linear regression has been obtained from the calculation of the value ∑x=208, ∑x^2=1492,25, ∑y=207,5, ∑y^2=1453,75 with the coefficient formula a and b, that is:

$a = \frac{(\sum y_1)(\sum x_1^2)-(\sum x)(\sum x_1 y_1)}{n\sum x_1^2-(\sum x_1)^2}$

$= \frac{(207,5)(1492,25)-(208)(1453,75)}{30(1492,25)-(208)^2}$

$= \frac{309641,9-302380}{44767,5-43264}$

$= \frac{7261,9}{1503,5}$

a = 4,83

$b = \frac{\sum XY_1-(\sum X_1)(\sum Y_1)}{n\sum X_1^2-(\sum X_1)^2}$

$= \frac{30(1453,75)-(208)(207,5)}{30(1492,25)-(208)^2}$

$= \frac{43612,5-43160}{44767,5-43264}$

$= \frac{452,5}{1503,5} = 0,301$

After obtaining the values of a and b, substitute them into the following formula:

y = a+bx

= 4,83+0,301x

To test the linearity of the regression we used analysis of variance:

Jk a= $\frac{(\sum Y_1)^2}{n}$

$= \frac{(207,5)^2}{30}$

$= \frac{43056,25}{30}$

= 1435,21

jk (T) = $\sum Y^2$

= 1499,25

The residual sum of squares is:

Jk (res) = jk (T) – jk(a) – jk(a/b)

= 1499,25-1435,21-4,54

= 59,5

The residual variance is:

S(res) = $\frac{jk(res)}{n-2}$

$= \frac{59,5}{30-2}$

$= \frac{59,5}{28}$

= 2,125

Regression variance is:

$S^2_{(reg)}$= jk (a/b)

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= 4,54

Freg = $\frac{4,54}{28} = \frac{jk(\frac{a}{b})}{n-2}$x0,162

S^2 (TC) = $\frac{200,45}{9-2} = \frac{jk\ (TC)}{(k-2)} = \frac{200,45}{7}$=28,64

S^2 (E) = $\frac{jk(E)}{jk(E)} = \frac{jk(E)}{n-k} = \frac{-140,95}{30-9} = \frac{-190,95}{21}$= -6,71

Freg = $\frac{S^2(TC)}{S^2(E)} = \frac{28,64}{-6,71}$ = -4,27

Tabel V
Anava for Linear Regression

Variance Source	Dk	Jk	KT	F
Total	30	1499,25	1499,25	-
Regression (a)	1	1435,21	1435,21	-
Regression (b/a)	1	4,54	4,54	0,162
Residue	28	59,5	2,125	
Tuna match	7	200,45	28,64	-4,27
Errors	21	-140,95	-6,71	

This means that Fcount <Ftable. Thus it can be concluded that if α = 0.05 then the numerator dk is 7 and the denominator dk is 21 then Ftable = 2.49 is obtained. For the linearity test, F = 4.27 < from Ftable = 2.49. So the linear regression model hypothesis can be adjusted.

B. Hypothesis Testing

Table VI
Data on Mastery of Exponentiation and Roots (x) and Students' Ability to Solve Logarithm Problems

No	X	Y	X²	Y²	XY
1	7	6,5	49	42,25	45,5
2	9	9	81	81	81
3	9	7	81	49	63
4	5	6	25	36	30
5	4	7	16	49	28
6	8	4	64	16	32
7	7	8	49	64	56
8	7	8	49	64	56
9	6,5	7	42,5	49	45,5
10	6,5	7	42,5	49	45,5
11	8	7,5	64	56,25	60
12	4	7	16	49	28
13	8,5	9	72,5	81	76,5
14	9,5	7,5	90,25	56,25	71,25
15	9,5	8,5	90,25	72,25	80,25
16	4	9	16	81	36
17	7	4	49	16	28
18	5	5	25	25	25
19	8,5	8,5	72,25	72,25	72,25
20	6,5	8,5	36	72,25	55,25
21	6,5	8,5	36	64	52
22	7	5	49	25	35
23	6	6,5	36	42,25	39
24	8	7	64	49	56
25	7	6	49	36	54
26	6,5	7	42,25	49	45,5
27	5	5	25	25	25
28	7	4	49	16	28
29	7,5	7,5	56,25	56,25	56,25
30	7,5	7,5	56,25	56,25	56,25
Jlh	208	207,5	492,25	1499,25	1453,75

To calculate the correlation coefficient between variables X and Y, the product moment correlation formula is used. From table VI obtained:

$\sum x$ = 208
$\sum x^2$ = 1492,25
$\sum y$ = 207,5
$\sum y^2$ = 1499,25

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$\sum xy$ = 1453,75

So tcount = 1.48 while t 0.93 from the student distribution list is = 1.31 thus tcount>ttable. So tcount = 1.48 while t 0.93 from the student distribution list is = 1.31 thus the tcount> ttable. Thus between the mastery of exponentiation and roots from logarithm problems, there is a significant relationship to see how much the contribution of variable x and variable y is used the coefficient of determination r^2 = 0.93 from the student distribution list is = 1.31.

$$r^2 = \frac{b(n\sum xiyi-(\sum xi)(\sum yi))}{n\sum y1^2-(\sum y1)^2} \quad b = 0{,}301$$

$$= \frac{0{,}301\{30(1453{,}75)-(208)(207{,}5)\}}{30(1499{,}25)-(207{,}5)^2}$$

$$= \frac{0{,}301(43612{,}5-43160)}{44977{,}5-43056{,}25}$$

$$= \frac{0{,}301(452{,}5)}{1921{,}25}$$

$$= \frac{136{,}2025}{1921{,}25}$$

r^2= 0,27

From the above calculations, it turns out that the coefficient of determination r^2 is 0,27. This means that the contribution of mastery of exponentiation and roots to solving and logarithms is 27%.

4. CONCLUSION

Based on the research results that have been described, the following conclusions can be drawn:

1. The average result of students' mastery on the subject of exponentiation and roots is 6.93 with a standard deviation of 1.32
2. The average student mastery results on the subject of logarithms is 6.92 with a standard deviation of 1.49
3. The product moment person coefficient value is 0.27
4. The coefficient of determination r2 is 27%

5. REFERENCES

[1] Purwanto. 2008. Evaluasi Hasil Belajar. Surakarta: Pustaka Pelajar.
[2] Sugiyono. 2012. Metodologi Penelitian Kuantitatif Kualitatif dan R&D. Bandung: Alfabeta.
[3] Syah, Muhibbin. 2012. Psikologi Belajar. Jakarta: Rajawali Pers.
[4] Arikunto Suharsimi(1983).Pendidikan Dasar-dasar Evaluasi pendidikan.Jakarta : Bumi aksara.
[5] -------------------------(1993).Prosedur Penelitian.jakarta ; Rineka Cipta
[6] Dosen FKIP UMSU.(2000).Belajar Pembelajaran.Medan : Diklat
[7] Noormandiri,Sucipto Endar (2004).Matematika 1 untuk SMK.Jakarta : Erlangga.
[8] Hamalik Oemar(1994).Kurikulum dan pembelajaran .Jakarta : Bumi Aksara
[9] Hakim,Andi (1994).Matematika 2 untuk SMU : Jakarta : departemen Pendidikan dan Kebudayaan.
[10] Herman Hudojo(1990).Strategi mengajar Belajar Matematika.IKIP Malang
[11] M.Cholik Adinawan (1999).Matematika 3 untuk SLTP.Jakarta : Erlangga
[12] Putra(2004).Matematika SMA kelas X .Jakarta: Grasindo
[13] Simanjuntak,Lisnawaty (1993).Metode Mengajar Matematika I.Jakarta :Rineka Cipta
[14] Slameto (1995).Belajar dan Faktor Yang mempengaruhinya.Jakarta : Rineka Cipta
[15] Sunardi,Haryanta (1994).Matematika 3 untuk SMP .Jakarta : Cempaka Putih.
[16] Sudjana (1989).Metode Stastika.Bandung: Tarsito
[17] Suwah,Marsal (2004).matematika untuk SMA kelas X semester 1 .Jakarta: Yrama Widya