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## **Abstract**

This study aimed at investigating the effect of using the strategy of formative assessment for the ninth grade students in the development of mathematical thinking and the acquisition of mathematical concepts , the sample of the study was formed from the 9th grade students in public schools that are related to the North directorate of Hebron in the second semester of the studding year 2010/2011, the purposed study sample consists of (140 ) students (73 male, and 67 female students) were distributed in four sections at two schools in Halhoul (two sections in each school), one of them was selected as experimental ( studied by the formative assessment strategy) and the second one was control group (studied by the traditional way).

To achieve the study objectives, two instruments were used, mathematical thinking test, and the mathematical concepts test. Validity and reliability of both tests was established, they have been applied on both testing groups members before and after the experiment. Data was analyzed using means, standard deviations and (ANCOVA) test.

The findings of the study were: A significant difference between the mean scores of the experimental and control groups was found in the test of mathematical thinking in favour of the experimental group, And no significant difference was found due to Gender and the interaction of group and sex, the results also showed that there are A significant difference between the mean scores of the experimental and control groups was found in the test of acquisition of mathematical concepts in favour of the experimental group, And no significant difference was found due to sex and the interaction of group and sex.

Based on results the study, the necessity of using the strategy of formative assessment in teaching mathematics, and conduct studies on the impact of such evaluation strategy in other classes and other topics dealing with this study and other variables was recommended.

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على التحصيل والاحتفاظ بالتعلم لدى تلميذات الصف السابع في

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57.51	48.24			
18.44	17.57			
37	37			
54.45	47.48			
9.78	12.42			
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56.07	47.88			
14.987	15.25			
70	70			
49.81	46.92			
17.03	16.79			
36	36			
53.85	47.53			
15.84	16.81			
34	34			
51.77	47.22			
16.47	16.68			
70	70			
53.71	47.59			
18.06	17.08			
73	73			
54.15	47.51			
13.11	14.70			
67	67			
53.92	47.55			
15.83	15.93			
140	140			

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0.000*	245.68	21771.69	1	21771.69		
0.023*	5.25	465.37	1	465.37		
0.73	0.12	10.62	1	10.62		
0.061	3.58	317.20	1	317.20	*	
		88.62	135	11963.64		
			139	34832.14		

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1.13	52.09		
1.13	55.74		

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( 52.09 )

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67.76	35.35			
20.81	3.87			
37	37			
70.64	35.21			
11.97	6.18			
33	33			
69.12	35.28			
17.16	5.06			
70	70			
60.56	35.47			
18.83	4.80			
36	36			
54.65	35.26			
24.23	7.57			
34	34			
57.69	35.37			
21.67	6.25			
70	70			
64.21	35.41			
20.05	4.32			
73	73			
62.53	35.24			
20.69	6.87			
67	67			
63.41	35.33			
20.30	5.67			
140	140			

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0.000*	19.37	6517.58	1	6517.58		
0.000*	14.21	4781.15	1	4781.15		
0.675	0.18	59.47	1	59.46		
0.163	1.97	661.78	1	661.78	*	
		336.59	135	45439.53		
			139	57283.60		

( 0.05 ≥ α )

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( Estimated Marginal Means )

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2.19	57.56		
2.20	69.25		

Estimate)

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$$\begin{aligned} (3 - )^2 &= 6 - 2 \quad .1 \\ (3 + 2)(3 - 2) &= 9 - 4 \quad .2 \\ (2 + )(4 - ) &= 8 - 2^{-2} \quad .3 \end{aligned}$$

:

$$\begin{aligned} ( ) &= 2^{-2} \quad .1 \\ \dots\dots\dots & \\ ( ) &= 16 - 2 \quad .2 \\ \dots\dots\dots & \\ : & = 8 + 6^{-2} \quad .3 \\ \dots\dots = 2 = & = ( \dots\dots\dots )( \dots\dots\dots ) \end{aligned}$$

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$$5 = 2 + 2 \quad .1$$



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$$= 6+ 5 + ^2$$

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$$+ \quad +^2 = ( \quad ) \quad .1$$

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**(10)**

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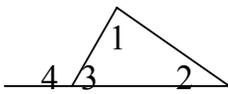
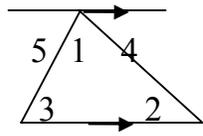
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$\begin{aligned} &: \\ &(4 + 6 + 9)(2 - 3) = 8 - 27 \\ &(9 + 12 + 16)(3 - 4) = 27 - 64 \\ &(4 + 8 + 16)(2 - 4) = 8 - 64 \\ &(\dots\dots\dots)(\dots\dots) = 3^3 - 3^3 \end{aligned}$	1	
$\begin{aligned} &: \\ &(2 \quad \quad) 1 = 2^1 \\ &(2 \quad \quad) 9 = 2^3 \\ &(2 \quad \quad) 25 = 2^5 \\ &(2 \quad \quad) 49 = 2^7 \\ &\dots\dots\dots : \end{aligned}$	2	
$\begin{aligned} &: \\ &: 57 \quad 48 \quad \dots \quad 30 \quad 21 \quad 12 \\ &66 \cdot \quad \quad 41 \cdot \quad \quad 39 \cdot \quad \quad 35 \cdot \end{aligned}$	3	
$\begin{array}{r} 15 \\ 28 \\ 66 \\ = \end{array} \quad \quad \quad \begin{array}{r} 1 \\ 1 \\ 1 \\ 1 \end{array} \quad \quad \quad \begin{array}{r} 5 \\ 7 \\ 11 \\ \end{array} \quad \quad \quad \begin{array}{r} 3 \\ 4 \\ 6 \\ \end{array}$	4	
$\begin{aligned} &2^1 = 1 : \\ &2^2 = 3 + 1 \\ &2^3 = 5 + 3 + 1 \\ &2^4 = 7 + 5 + 3 + 1 \\ &.( \quad \quad ) \dots\dots\dots = 2^2 : \end{aligned}$	5	

الاستنتاج				ثانياً
°180 =				1
°90 .	°60 .	°45 .	°30 .	
:				2
°360 .	°180 .	°120 .	°90 .	
:				3
6 4 3 .			12 7 5 .	
9 4 4 .			12 5 6 .	
:				4
		( )	:( )	
:				5
(18)	(3)	( )	(18) ( )	
		(3)	(18) ( )	
تفكير منطقي				ثالثاً
:				1
:				

$\frac{7+^2}{1+^2} \cdot ( + ) 3 \cdot 2$	2
:	3
:	4
$32 \cdot 28 \cdot 24 \cdot 20 \cdot 5$	5
البرهان الرياضي	رابعاً
<p style="text-align: right;">:</p> <p>( : ) °180 = 4 &gt; + 3 &gt; .1</p> <p>( °180 : ) °180 = 3 &gt; + 2 &gt; + 1 &gt; .2</p> <p>( ..... : ) 4 &gt; + 3 &gt; = 3 &gt; + 2 &gt; + 1 &gt; .3</p> 	1
<p>( ) °180</p>  <p style="text-align: right;">:</p> <p>( ) 4 &gt; = 2 &gt;</p> <p>..... : ..... = 3 &gt; :</p>	2
$1 = 2$ <p>.....</p>	3

<p>.....</p>	4														
<p>أعط مثلاً يبين خطأ العبارة الآتية:</p> $\sqrt{ص} + \sqrt{س} = \sqrt{ص + س}$ <p>حيث س ، ص عددين صحيحين</p> <p>.....</p> <p>.....</p>	5														
التعبير بالرموز															
<p>.....</p> <p style="text-align: center;">25</p> <p>.....</p>	1														
<p>( )</p> <p>..... :</p> <p>( )</p>	2														
<p>.....</p> <p style="text-align: center;">19</p> <p>..... :</p>	3														
<p>( ) ( )</p> <p>.....</p>	4														
<p style="text-align: center;">:</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td> </td> </tr> </table> <p style="text-align: center;">= + :</p> <p style="text-align: center;">5 = 3 + 2</p> <p>..... = ..... - ( ..... × ..... ) :</p> <p style="text-align: center;">3 = 4 - ( 7 × 1 )</p>	7	6	5	4	3	2	1								5
7	6	5	4	3	2	1									

(4)

$25 = 2^2 + 2^2$	$+ 3 > = ^\circ 180$ $4 >$			$(2^2 + 2^2)(-)$	1
$2 + 4$	$5 >$				2
$(- 19)$	$1/2$				3
$2 = 2^2 + 2^2$					4
$= - ( \times )$					5

(5)

( ) : ..... :  
2011 / / : : ..... : /

( 35)

: /

(20) : : .1

= 4 - 10 :

5 . 4 .  
7 . (6) .

(15) :

(15) (20) (35) .2

( 20 ) :

:

:

.1

$$5 = 4 + \dots$$

$$3 + 5 + \dots^2$$

$$2 + \dots$$

$$= 5 + \underline{3}$$

$$5 - \dots = 3 + 3$$

.2

$$3 - \dots$$

$$4 - \dots$$

$$3 \dots$$

$$4 \dots$$

:

.3

$$+ \dots +^2 \dots$$

$$= + \dots$$

$$= + \dots +^2 \dots$$

$$+ \dots +^2 = ( \dots ) \dots$$

$$: \dots = (7 + \dots) 3$$

.4

$$21 \dots$$

$$7 \dots$$

$$1 \dots$$

$$3 \dots$$

:

.5

$$9 \dots$$

$$8 \dots$$

$$25 \dots$$

$$64 \dots$$

:

$$= (1 + \dots)(2 - \dots)$$

.6

$$\{1 \ 2\} \dots$$

$$\{1 \ 2-\} \dots$$

$$\{1 \ 2-\} \dots$$

$$\{1-\ 2\} \dots$$

$$: \ 49 = \dots^2$$

.7

$$\{7-\ 7-\} \dots$$

$$\{7 \ 7-\} \dots$$

$$\{7 \ 7\} \dots$$

$$\{0 \ 49\} \dots$$

$$3 = 6 + \dots^2$$

.8

:

$$4 \dots$$

$$9 \dots$$

$$6 \dots$$

$$3 \dots$$

$$2 - . : = 5 + 6 + ^2 3 \quad .9$$

$$2 - . \quad 2 . \quad 5 / 3 \quad 9 .$$

$$5 - . : 7 + 5 = ^2 \quad .10$$

$$5 - . \quad 5 . \quad 7 - . \quad 7 .$$

$$: ( ) \quad 2 - 6 = 4 - ^2 \quad .11$$

$$1 - . \quad 1 . \quad 2 - . \quad 2 .$$

$$= (1 - ) \quad 1 - 5 + ^2 = ( ) \quad .12$$

$$. \quad 5 . \quad 1 - . \quad 5 - .$$

$$: 2 + ^2 = ( ) \quad .13$$

$$(2 \ 2) . \quad (2 - 0) . \quad (2 \ 0) . \quad (0 \ 0) .$$

$$: ^2 - 3 = ( ) \quad .14$$

$$3 \quad ^2 = ( ) \quad ^2(3 - ) = ( ) \quad .15$$

$$: 3 + ^2(2 - ) = ( ) \quad .16$$

$$3 - = . \quad 2 - = . \quad 3 = . \quad 2 = .$$

$$< 4 - ^2 \quad = + + ^2 \quad .17$$

$$: > 4 - 2 \quad .18$$

.....  
.....

$$: = 3 - 2 \quad .19$$

9 . . . . . 3 . . . . . 9 - .

$$: 3 \ 2 - \quad .20$$

$$= 6 - + 2 \quad . \quad = 6 - - 2 \quad .$$

$$= 6 + + 2 \quad . \quad = 6 + - 2 \quad .$$

السؤال الثاني: أجب عن الأسئلة التالية في الفراغ المحدد: (15 علامة)

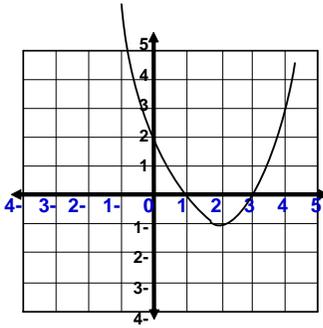
1. استخدم التحليل إلى العوامل في حل المعادلة التربيعية  $x^2 - 12 = 0$  (علامتان)

.....  
.....

2. استخدم القانون العام في حل المعادلة التربيعية  $x^2 + 3x - 4 = 0$  (علامتان)

.....  
.....  
.....  
.....

3. يبين الشكل المجاور منحنى الاقتران  $y = x^2 + x + 2$  اعتماداً على الرسم أجب عما يلي: (5 علامات)



(1) جذور المعادلة التربيعية المرافقة للاقتران هي:

.....  
(2) القيمة العظمى أو الصغرى للاقتران هي:

.....  
(3) معادلة محور التماثل هي:

.....  
(4) إحداثيات الرأس هي:

.....  
(5) مدى الاقتران هو:

4. جد قيمة (م) التي تجعل للمعادلة  $2س^2 - م س + 8 = 0$  جذراً واحداً  
(جذرين متساويين). (علامتان)

.....  
.....  
.....

5. يزيد طول مستطيل عن عرضه. 2سم، جد كلاً من الطول والعرض إذا كان طول القطر 10سم.  
(4 علامات)

.....  
.....  
.....  
.....

انتهت الأسئلة

(6)

-	-			
$\neq \frac{1}{i}$ $\neq \frac{2}{i}$	-	$=$ $=$ $+^2$ $\sqrt{\left(\frac{b}{i}\right)}$ $= + +2$ $:$ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} =$	-	-
-	-	$= + +2$ $\frac{1}{i}$ $\frac{2}{i} =$ $= + +^2$ $:$	-	-

$\begin{array}{c} \cdot \\ - \\ , \\ ( 2 , 2 ) \\ ( 1 , 1 ) \\ \underline{\quad \quad} \\ \cdot ( 2 , 2 ) \end{array}$		$\begin{array}{c} + ( \quad )^2 \\ = \end{array}$		
--	--	---	--	--

$\begin{array}{c} - \\ : \\ 2( - ) = ( ) \\ : \\ -1 \\ -2 \\ -3 \\ -4 \\ / \\ -5 \\ \cdot \\ +^2( - ) = \end{array}$	$\begin{array}{c} - \\ ( ) \\ 2 = \\ - \\ + \\ - \\ ( ) \\ 2( - ) = \\ - \\ ( ) \\ +^2( - ) = \end{array}$	$\begin{array}{c} - \\ : \\ \cdot \\ +^2 = ( ) \\ 2 = ( ) \\ \cdot \\ ( -^2 ) = ( ) \\ = ( ) \\ \cdot \\ - ) = ( ) \\ \cdot \\ +^2( \\ 2 = ( ) \end{array}$	$\begin{array}{c} - \\ - \\ - \\ - \\ - \\ / \\ - \\ - \\ +^2( \\ 2 = ( ) \end{array}$	
--	--	---	--	--

	$( )$ $^2 =$ $\ominus$ $*$ $*$	$\cdot ( , )$ $+^2 = ( )$ $:$ $+$ $0 <$ $0 >$		
$+^2$ $= +$	$+^2$ $= +$	$= + +^2$ $< 4^{-2}$ $= 4^{-2}$ $\frac{1}{2}$ $> 4^{-2}$	$:$ $4^{-2}$ $-$ $-$ $-$	

<p>-</p> <p>.</p> <p>-</p> <p>.</p> <p>+</p>	<p>-</p> <p>" "</p> <p>.</p> <p>-</p> <p>.</p>	<p>" "</p> <p>.</p> <p>.</p>	<p>-</p> <p>-</p>	

(7)

-1	-1	-1	-
-1	-1 -2 -3 -4 -5	-1 -2 -3 -4 -5	-
-1	-1	-1 -2	-

-1	-1 -2 + <sup>2</sup> = ( ) + + <sup>2</sup> ( + ) = ( ) -3	-1 -2 : - - - -3 + <sup>2</sup> = ( )	-
-1	-1 -2	-1 -2	-
-1	-1 -2	-1	-

( 8 )

<b>%100</b>						
	<b>%16</b>	<b>%38</b>	<b>%46</b>			
2		1	1	%7	2	
11	2	4	5	%30	8	
4	1	1	2	%11	3	
9	1	4	4	%26	7	
5	1	2	2	%15	4	
4	1	1	2	%11	3	
35	6	13	16	%100	27	

(9)

( ) :

ج	1
ب	2
أ	3
د	4
هـ	5
و	6
ز	7
ح	8
ط	9
ي	10
ك	11
ل	12
م	13
ن	14
س	15
ع	16
ف	17
ق	18
ر	19
ش	20

:

$$\begin{aligned} ( ) &= (3 + )(4 - ) : & &= 12 - -^2 .1 \\ ( ) & & 4 = & = (4 - ) \\ ( ) & & 3 - = & = (3 + ) \end{aligned}$$

$$4 - = \quad 3 = \quad 1 = : \quad = 4 - 3 + ^2 \quad .2$$

$$\frac{5 \pm 3 -}{2} = \frac{\sqrt{16 + 9} \pm 3 -}{2} = \frac{\sqrt{4 - ^2} \pm -}{2} =$$

$$( \quad + \quad ) 4 - = \quad 1 =$$

$$( \quad ) .3$$

$$\cdot \{ 3 \ 1 \} \quad (1$$

$$1 - \quad (2$$

$$2 = \quad (3$$

$$( 1 - 2 ) : \quad (4$$

$$\{ 1 - \leq \quad : \quad \} : \quad (5$$

$$= 8 + \quad - ^2 \quad 2 \quad .4$$

$$8 = \quad - = \quad 2 =$$

=

$$( \quad ) = 4 - ^2$$

$$= ( 8 + ) ( 8 - ) = 64 - ^2$$

$$( \quad ) 8 - = \quad = 8 + \quad 8 = \quad = 8 -$$

$$( \quad 4 ) .4$$

$$( \quad ) 2 + \quad = \quad :$$

$$( \quad ) = \quad + \quad 100 = 2^2 + 2^2(2 + \quad)$$

$$100 = 2^2 + 4 + 4 + 2^2$$

$$2 \quad = 96 - 4 + 2^2 \quad 2$$

$$( \quad ) = 48 - 2 + 2^2$$

$$\begin{aligned} 8 - 6 = \quad 8 - = \quad &= (6 - \quad)(8 + \quad) \\ ( \quad ) \quad 8 = 2 + 6 \quad &6 = \quad . \end{aligned}$$

( 10 )

: /

**Al-Quds University**  
Faculty of Educational Science  
Graduate Studies Programs



**جامعة القدس**  
كلية العلوم التربوية  
برامج الدراسات العليا

الرقم: ب د ع/11/12/401/12  
التاريخ: 2011/02/28

حضرة مدير التربية والتعليم المحترم  
محافظة شمال الخليل

الموضوع: تسهيل مهمة

تحية طيبة وبعد،،  
يقوم الطالب: عمر محمد أحمد الحروب، ورقمه الجامعي (20911860)، بدراسة تجريبية تتعلق  
برسالة ماجستير بعنوان

أثر إستراتيجية التقويم التكويني في اكتساب المفاهيم الرياضية وتنمية التفكير الرياضي لدى طلبة  
الصف التاسع الأساسي

لذا يرجى من حضرتكم تسهيل مهمة الطالب المذكور أعلاه والتعاون معه، ولتطبيق الدراسة  
خلال الفصل الدراسي الثاني 2011/2010.

شاكرين لكم حسن تعاونكم

والله الموفق

د. محسن عدس  
منسق برنامج أساليب التدريس / كلية العلوم التربوية

Palestinian National Authority  
Ministry of Education & Higher Education  
Directorate of Education /North Hebron



السلطة الوطنية الفلسطينية  
وزارة التربية والتعليم العالي  
مديرية التربية والتعليم / شمال الخليل

الرقم : ت.ش.خ. / ٤٠ / ١١ / ٦٦٢  
التاريخ: ٢٠١١/٠٣/٢١ م.  
الموافق: ١٤٣٢/٠٤/١٦ هـ.

حضرة مدير مدرسة عمر التميمي الاساسية للبنين "ب" المحترم.

الموضوع: تسهيل مهمة / إجراء دراسة

نُهديكم أطيب التحيات و بخصوص الموضوع أعلاه ، أرجو السماح للدارس: (عمر محمد الحروب) بإجراء دراسته الميدانية بعنوان " أثر استراتيجية التقويم التكويني في اكتساب المفاهيم الرياضية وتنمية التفكير الرياضي لدى طلبة الصف التاسع الاساسي " بتطبيق الاختبارين المعدين لهذه الدراسة على طلبة الصف التاسع الاساسي، على أن تكون خارج نطاق الحصص الدراسية وأن لا يؤثر ذلك على سير العملية التعليمية.

مع الاحترام

ام مدحت طهبوب  
مديرة التربية والتعليم  
السلطة الوطنية الفلسطينية  
وزارة التربية والتعليم  
مديرية التربية والتعليم - شمال الخليل

ح.م.ع- د.ع / للتعليم العام ١٩/٢

Palestinian National Authority  
Ministry of Education & Higher Education  
Directorate of Education /North Hebron



السلطة الوطنية الفلسطينية  
وزارة التربية والتعليم العالي  
مديرية التربية والتعليم / شمال الخليل

الرقم : ت.ش.خ/١١ / ٦٦٣  
لتاريخ: ٢٠١١/٠٣/٢١ م.  
للموافق: ١٤٣٢/٠٤/١٦ هـ.

حضرة مديرة مدرسة شهداء لحلول الاساسية للبنات المحترمة.

الموضوع: تسهيل مهمة / اجراء دراسة

نُهديكم أطيب التحيات و بخصوص الموضوع أعلاه ، أرجو السماح للدارس: (عمر محمد الحروب) بإجراء دراسته الميدانية بعنوان " أثر استراتيجيات التقويم التكويني في اكتساب المفاهيم الرياضية وتنمية التفكير الرياضي لدى طلبة الصف التاسع الاساسي " بتطبيق الاختبارين المعدين لهذه الدراسة على طلبة الصف التاسع الاساسي، على أن تكون خارج نطاق الحصص الدراسية وأن لا يؤثر ذلك على سير العملية التعليمية.

مع الاحترام

أ. بسام مدحت طهبوب



ح-ع-د /التعليم العام ١٩/٢

رقم الصفحة		
39		1.3
40		2.3
47		1.4
48	( ANCOVA )	2.4
49	( Estimated Marginal Means )	3.4
51		4.4
52	( ANCOVA )	5.4
53	( Estimated Marginal Means )	6.4

71		1
81		2
82		3
87		4
88		5
93		6
97		7
99		8
100		9
103	/	10
104	( )	11
105		12

<b>9 - 1</b>	:
1	
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<b>37 - 10</b>	:
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<b>45 - 38</b>	:
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<b>54 - 46</b>	:
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<b>58 - 55</b>	:
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<b>69 - 59</b>	
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<b>105 - 70</b>	
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108	