MARKER CODE			

STUDENT EDUCATION NUMBER									

Samoa School Certificate
MATHEMATICS
2015
QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours& 10 Minutes

INSTRUCTIONS:

1. You have 10 minutes to read**before** you start writing.
2. Write your **Student Education Number (SEN)** in the space provided on the top right hand corner of this page.
3. Answer **ALL QUESTIONS**. Write your answers in the spaces provided in this booklet.
4. If you need more space for answers, ask the Supervisor for extra paper. Write your SEN on all extra sheets used and clearly number the questions. Attach the extra sheets at the appropriate places in this booklet.

STRANDS	Page number	Time (minutes)	Weighting
STRAND 1: NUMBERS	2 – 3	22	12%
STRAND 2: ALGEBRA	4 – 8	59	33%
STRAND 3: MEASUREMENTS	9 – 11	27	15%
STRAND 4: TRIGONOMETRY	12 – 13	29	16%
STRAND 5: GEOMETRY	14 – 16	29	16%
STRAND 6: PROBABILITY	17 – 18	14	14%
TOTAL		**180**	**100**

Check that this booklet contains pages 2–19 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THESUPERVISORAT THE END OF THE EXAMINATION.

STRAND 1: NUMBERS WEIGHTING

1.1 State the order of operation of numbers.

_____

_____

_____

Skill Level 1	
1	
0	
NR	

1.2 Identify which pair of fraction is equivalent. *Circle the right answers.*

$$\frac{14}{25}\ ,\ \frac{36}{45}\ ,\ \frac{24}{30}\ ,\ \frac{72}{90}$$

Skill Level 1	
1	
0	
NR	

1.3 The number of decimal places in the decimal number 0.05067 is

_____

Skill Level 1	
1	
0	
NR	

1.4 Define the word *percentage.*

_____

_____

_____

Skill Level 1	
1	
0	
NR	

1.5 Calculate 3^{-4}

Skill Level 2	
2	
1	
0	
NR	

1.6 At *My Shop,* $\frac{2}{3}$ of all canned food are tuna fish, $\frac{1}{4}$ of all canned food are corned beef and the rest are fruits and vegetables.

What fraction of canned food at *My Shop* are fruits and vegetables?

Skill Level 3	
3	
2	
1	
0	
NR	

1.7 There are 750 different types of canned food at *My Shop*. 28% of the different types of canned food are local products.

Calculate how many types of canned food are NOT local products

Skill Level 3	
3	
2	
1	
0	
NR	

2.1 Define *linear equation.*

Skill Level 1	
1	
0	
NR	

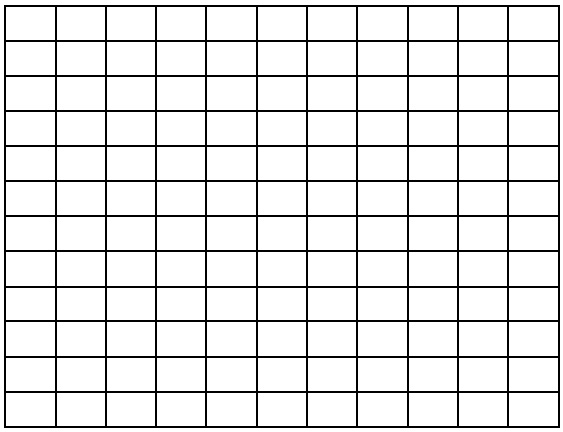
_____

_____

_____

The equation *5y – 4x = 20* represents a linear function.
The x-intercept is ⁻5 and the y-intercept is 4.

2.2a On the grid, draw and label the x and y axis.



Skill Level 1	
1	
0	
NR	

2.2b Show the process of obtaining the x and y intercepts.
(ie: x = -5 and y = 4)

Skill Level 2	
2	
1	
0	
NR	

_____

_____

_____

_____

_____

_____

Skill Level 1	
1	
0	
NR	

2.2c Plot the x and y intercepts on the Cartesian axis.

2.2d Join the points with a line segment.

Skill Level 1	
1	
0	
NR	

2.3 Define *linear in-equation*

Skill Level 1	
1	
0	
NR	

_____

_____

_____

2.4a On a number line, show $x \geq -2, x \in R$

Skill Level 1	
1	
0	
NR	

2.4b Show the solution $x \geq -2$ *on the Cartesian plane below.*

Skill Level 2	
2	
1	
0	
NR	

2.5 Solve $2 - \frac{3x}{5} \geq 8$ for all the possible values of ***x***.

Skill Level 3	
3	
2	
1	
0	
NR	

_____

_____

_____

2.6a Expand and simplify $(1 – 2x)(x + 3)$

Skill Level 2	
2	
1	
0	
NR	

_____

_____

_____

2.6b Describe the general shape of the graph of the function

$y = (1 – 2x)(x + 3)$

Skill Level 2	
2	
1	
0	
NR	

_____

_____

_____

2.6c Which of the functions given below is a cubic function?

A. $y = 20 – 3x$

B. $4y^3 = 3x^2 + 6x - 9$

C. $y = 2x^2 + 4x + 5$

D. $y = x^3 – 3x^2$

Skill Level 1	
1	
0	
NR	

2.7a Give the name of the function which has the equation $y= 2^x$

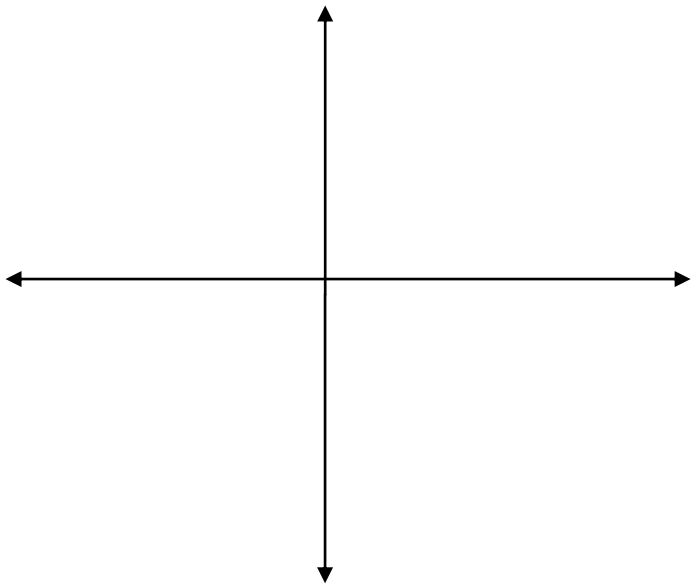
Skill Level 1	
1	
0	
NR	

2.7b Name ONE (1) feature of the function in (a) above?

Skill Level 1	
1	
0	
NR	

_____

2.7c Sketch the graph of $y = 2^x$.



Skill Level 1	
1	
0	
NR	

2.8a What is the value of the function given below when x= -2

$y = 4x^2 + 3x - 10$

_____

_____

_____

Skill Level 1	
1	
0	
NR	

2.8b Find the factors of $y = 4x^2 + 3x - 10$

_____

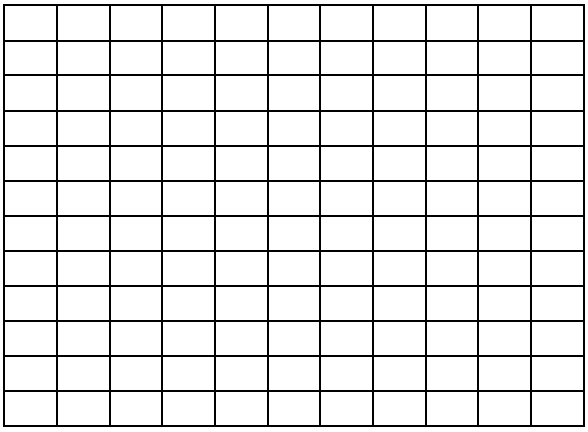
_____

_____

_____

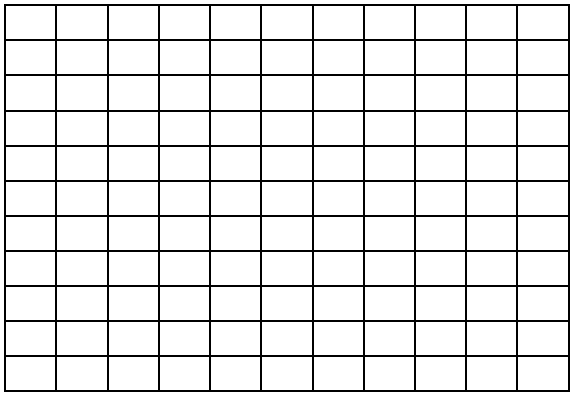
Skill Level 3	
3	
2	
1	
0	
NR	

2.8c Draw the graph of the function $y = 4x^2 + 3x - 10$



Skill Level 4	
4	
3	
2	
1	
0	
NR	

2.9 Draw the graph of $y = \frac{4}{x - 3}$



Skill Level 4	
4	
3	
2	
1	
0	
NR	

STRAND 3 MEASUREMENT WEIGHTING

3.1a A _____ provides information about a person's salary rate.

Skill Level 1	
1	
0	
NR	

3.1b Sam is earning $180 per hour making pancakes.
Explain how much he will earn in cents per second.

_____

_____

_____

_____

Skill Level 3	
3	
2	
1	
0	
NR	

3.2 Two friends left the same town at 10.30a.m. Tom arrived at the next city at 11.32a.m., while James arrived 2.52p.m. How much longer did James take?

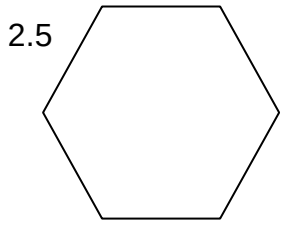
_____

_____

_____

Skill Level 1	
1	
0	
NR	

3.3a State the formula for calculating the perimeter of the regular hexagon below.



_____

Skill Level 1	
1	
0	
NR	

3.3b Calculate the perimeter (in meters) of the shape in (a)

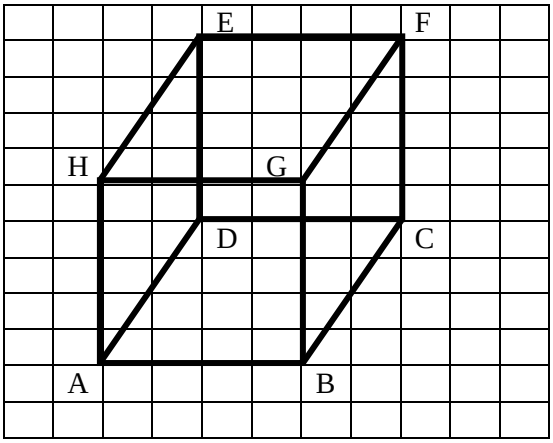
_____

_____

_____

Skill Level 1	
2	
1	
0	
NR	

Use the diagram below to answer the following questions



3.4a State a formula for calculating the volume of the figure given above.

Skill Level 1	
1	
0	
NR	

_____

3.4b Calculate the volume of the figure.

_____

_____

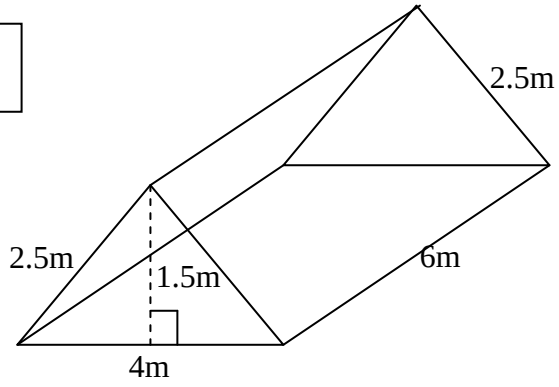
_____

Skill Level 2	
2	
1	
0	
NR	

3.5 A tent made from calico material, including the ground sheet, is in the shape of a triangular prism, as shown.

Calculate how much calico is needed to make the tent.

Diagram is NOT to scale



Skill Level 4	
4	
3	
2	
1	
0	
NR	

STRAND 4 TRIGONOMETRY WEIGHTING

4.1a State the Pythagoras theorem

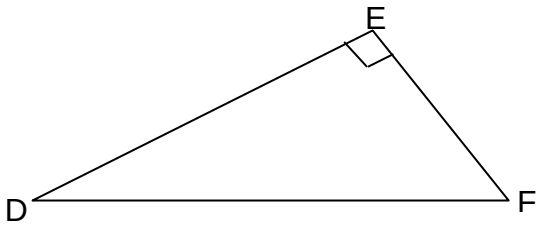
_____

_____

_____

Skill Level 1	
1	
0	
NR	

The triangle DEF shows the end of the roof on a house. Angle DEF is a right angle. $\overline{ED}$ is 3.25m long and $\overline{DF}$ 6.15m



4.1b Calculate the length of $\overline{EF}$?

_____

_____

_____

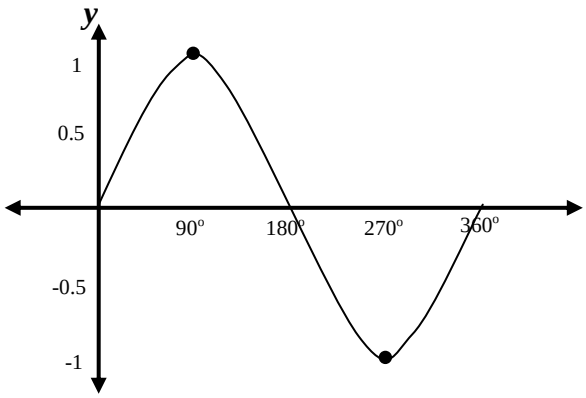
Skill Level 4	
4	
3	
2	
1	
0	
NR	

4.1c State the formula for Tangent of angle EDF.

_____

Skill Level 1	
1	
0	
NR	

Use the graph below to answer questions 4.2(a-c).



4.2a What is the name of the graph given above?

_____

Skill Level 1	
1	
0	
NR	

4.2b Determine the coordinates of the turning points of the trigonometric graph above.

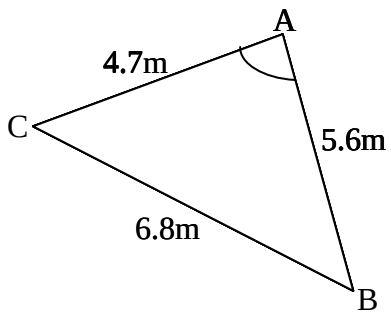
_____

Skill Level 1	
2	
1	
0	
NR	

4.2c On the same set of Cartesian axis, draw the graph of $y = \cos x$

Skill Level 3	
3	
2	
1	
0	
NR	

Use triangle ABC below to answer questions 4.3(a-b).



4.3a State the Rule to find the size of angle CAB.

_____

Skill Level 1	
1	
0	
NR	

4.3b Use the Rule in (a) to find the size of angle CAB.

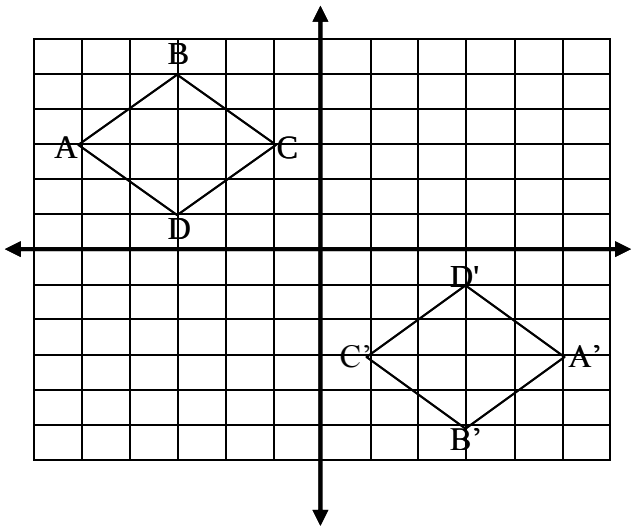
_____

_____

_____

Skill Level 3	
3	
2	
1	
0	
NR	

Use the diagram below to answer questions 5.1(a – c)



5.1a State the transformation given above.

_____

_____

_____

Skill Level 1	
1	
0	
NR	

5.1b Draw in the mirror line of the transformation in (a).

Skill Level 1	
1	
0	
NR	

5.1c On the same set of axis, locate the image of ABCD after rotation about the origin through 90^{o}. Label the image A''B''C''D''.

Skill Level 2	
2	
1	
0	
NR	

5.2a State ONE property of angles around a point.

_____

Skill Level 1	
1	
0	
NR	

5.2b State ONE property of co-interior angles.

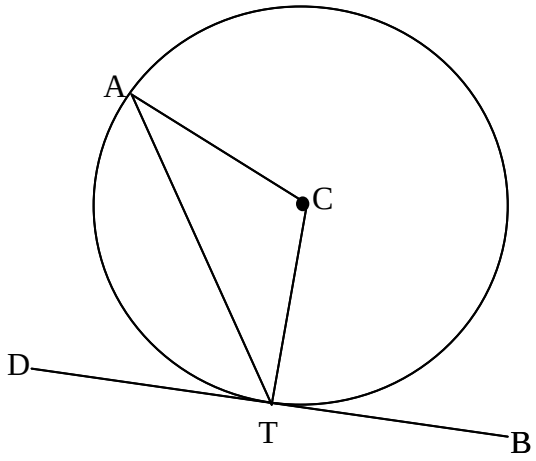
_____

Skill Level 1	
1	
0	
NR	

5.3 In the diagram below, points A and T lie on a circle with centre C. BD is a

tangent that touches the circle at T.
$\angle ATD = 72^o$ and AC = TC.

Diagram is NOT to scale



Skill Level 3	
3	
2	
1	
0	
NR	

Determine the value of the unknown angle TAC. Give a geometric reason for your answer.

_____

_____

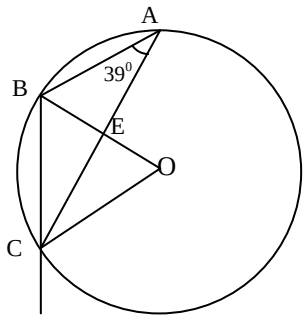
_____

_____

_____

5.4

Diagram is NOT to scale



Skill Level 3	
3	
2	
1	
0	
NR	

O is the centre of the circle

If angle ACB = x^0, find the size of angle OCA in terms of x.

You must give a geometric reason for each step leading to your answer

_____

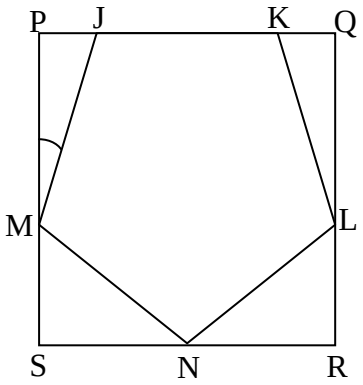
_____

_____

5.5 The diagram shows a rectangular stained-glass window PQRS.
One of the pieces of glass in the window is a rectangular pentagon JKLMN

Calculate the size of angle PMJ, giving reasons for your answer.

Diagram is NOT to scale



Skill Level 4	
4	
3	
2	
1	
0	
NR	

STRAND 6 PROBABILITY WEIGHTING

6.1 Define “probability of an event”

_____

_____

_____

Skill Level 1	
1	
0	
NR	

6.2 There are 45 plants with flowers in *My Garden*. 10 of the plants have blue flowers and 11 of the plants have white flowers. A plant is chosen at random from *My Garden.*

What is the probability that it has neither blue flowers nor white flowers?

_____

_____

_____

_____

Skill Level 3	
3	
2	
1	
0	
NR	

6.3 Define elements of set S given below.

S = {1, 4, 9, 16, 25, 36, 49}

_____

_____

Skill Level 1	
1	
0	
NR	

6.4 List down elements of set A, where

A = {whole numbers less than 100 divisible by 16}

_____

_____

Skill Level 1	
1	
0	
NR	

6.5 Let the universal set be E = {whole numbers less than 20} and let C = {odd squares less than 20}

List the elements of the union of the two sets (ie: $E \cup C$)

_____

_____

_____

_____

Skill Level 2	
2	
1	
0	
NR	

Student Education Number									

MATHEMATICS

2015

(For Markers only)

STRANDS	Weighting	Marker	Check Marker	Final Weighting
STRAND 1: NUMBERS				
STRAND 2: ALGEBRA				
STRAND 3: MEASUREMENTS				
STRAND 4: TRIGONOMETRY				
STRAND 5: GEOMETRY				
STRAND 6: PROBABILITY				
TOTAL	**100**			