GOVERNMENT OF SAMOA
MINISTRY OF EDUCATION, SPORTS AND CULTURE

STUDENT EDUCATION NUMBER									

Samoa National Junior Secondary Certificate

MATHEMATICS
2022

QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours & 10 minutes

INSTRUCTIONS

1. You have 10 minutes to read **before** you start the exam.
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 paper to write your 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		Pages	Time (min)	Weighting
STRAND 1	NUMBERS & OPERATIONS	2	12	7
STRAND 2	ALGEBRA	3 - 6	40	22
STRAND 3	STATISTICS & PROBABILITY	7 - 10	25	14
STRAND 4	MEASUREMENTS	11 – 13	32	17
STRAND 5	GEOMETRY	14 – 16	25	14
STRAND 6	TRIGONOMETRY	17 – 18	12	7
STRAND 7	RATES OF CHANGE	19 - 22	34	19
TOTAL			**180**	**100**

Check that this booklet contains pages 2-23 in the correct order and that none of these pages are blank.

HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

STRAND 1: **NUMBERS & OPERATIONS** **WEIGHTING 7**

1. Convert the number 0.0000089 into scientific notation.

SL 1

2. Simplify the expression $(3^{-1})^{2}$

SL 2

3. A Salesman and ASCO Motor had a deal to share the profit of every brand new Hiace van sold in the ratio of 2 : 3 for Salesman and ASCO Motor.
If the profit of selling one van is $34,588, determine the amount of money that the salesman will earn from 10 vans.

SL 4

4. Write this sentence ***"A quotient of a number and 4 is 36"*** as an algebraic expression.

SL 1

5. Expand the expression and simplify:

$$6\left(\frac{a}{3}+\frac{b}{2}-\frac{a}{2}\right)$$

SL 2

6. Sieni picks a number (x). She divides her number by 4 and then increases her answer by 4 to get 24. What is Sieni's number?

SL 3

7. Simplify the expression:

$$\frac{4a}{15} \div \frac{ab}{3}$$

SL 2

8. A rectangular plantation has a length of (3x + 2)m ,a width of 6m and an area of 48m^2.Calculate step by step the actual length of the rectangular plantation. [Hint: draw a labelled diagram]

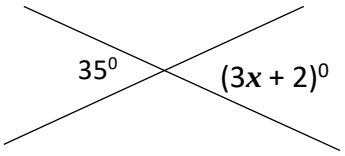
SL 4

9. Solve for the values of the **x** that makes the algebraic inequation true.

- 4x $<$ 8, and $x \in I$,

SL 3

10. Vertically opposite angles are equal. Solve for x.

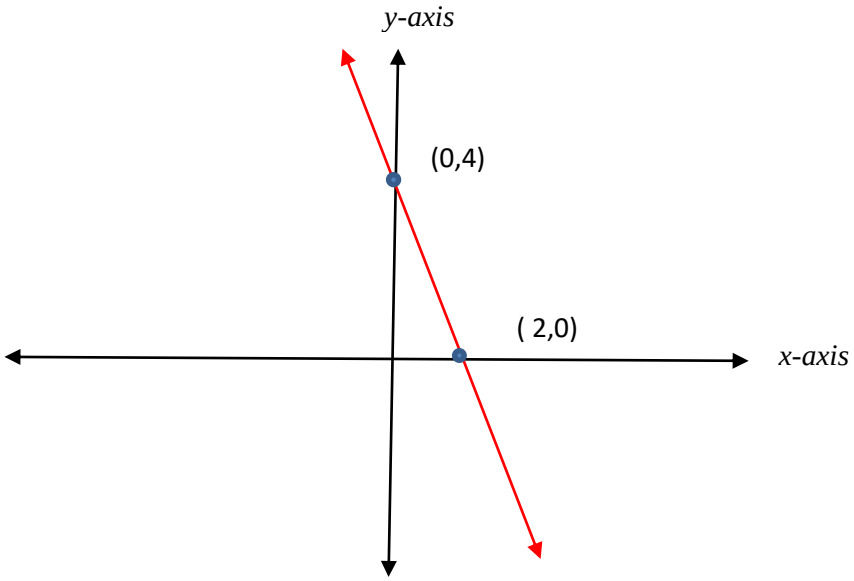


SL 2

11. Use an appropriate index law to write the answer for: $\sqrt[3]{a} =$

SL 1

12. Apply the gradient-intercept method and general form of a line, to find the *equation* for the line shown below. [Hint: the general form of a line, $y = mx + b$]



SL 4

Use Figure 2 below to answer Question 13.

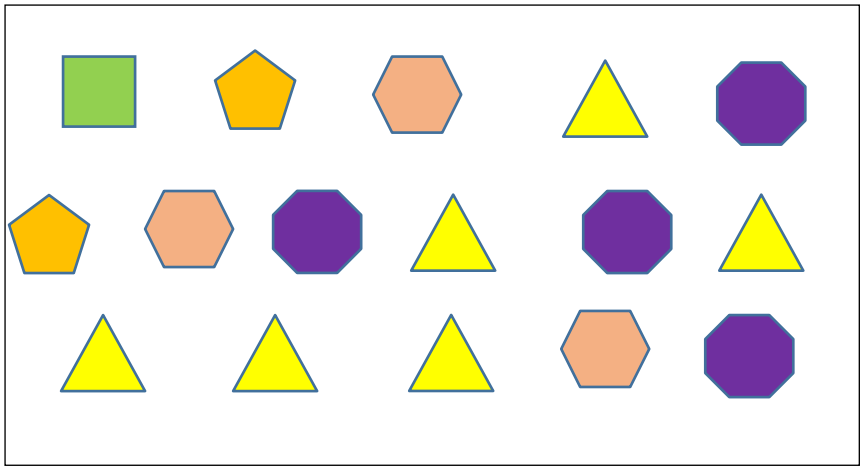
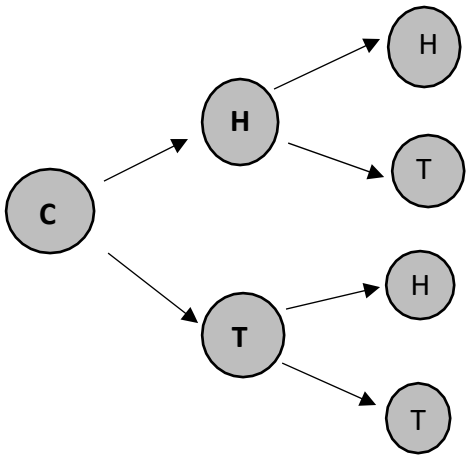


Figure 2: Some common polygons

13. Find p(△)

SL 1

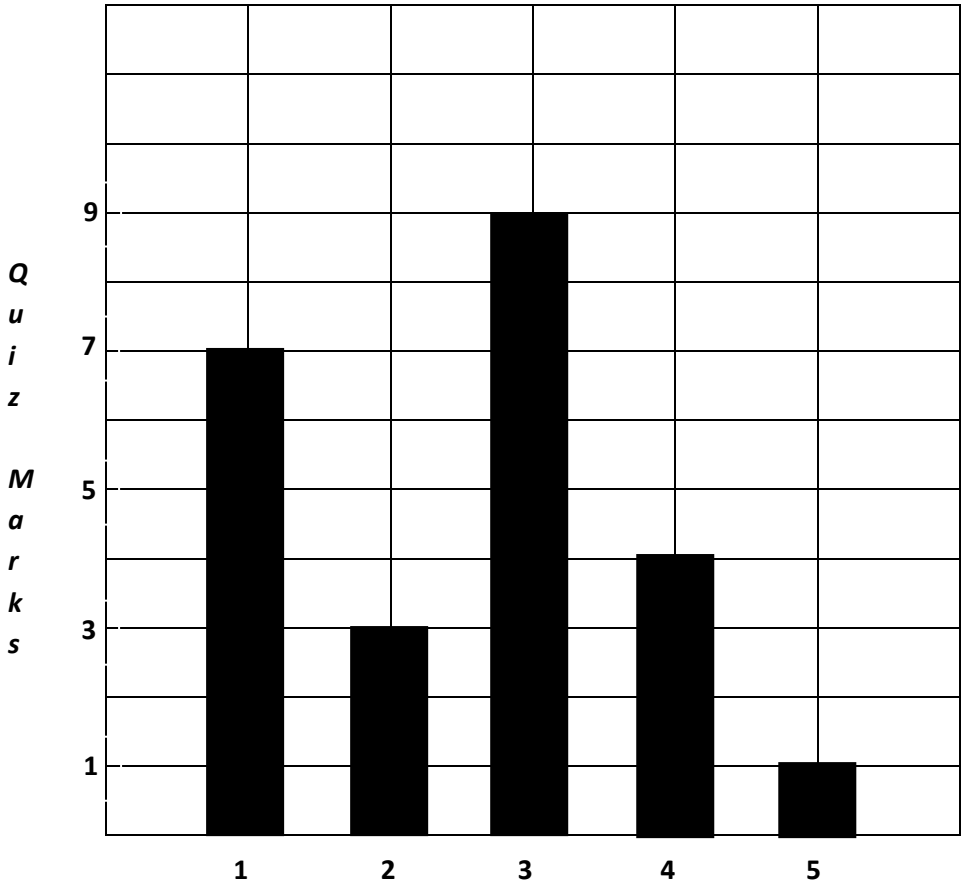
14. Simaika tossed a coin two times. Find the probability of getting a head and tail using the tree diagram below.



SL 2

Fifteen students sat a 10-marks Maths Quiz. The teacher analysed the results and present them on a bar graph as shown below.

Maths Quiz vs Class of 15



15. From the information and the bar graph above, find the number of students who did not pass the quiz.

SL 2

16. State the formula for calculating the probability of an event.

SL 1

17. Tossing a coin is an independent event. **TRUE** or **FALSE ?**

SL 1

18. The following set is a set of scores:

$$\{15, 20, 32, 11, 23, 10, 25, 34, 35, 13\}$$

Display the scores using Stem and Leaf Plot.

SL 3

19. The Magiagi soccer team played 8 games in the District Soccer Tournament and the results were recorded in the frequency table below. Complete the table by filling in the answers for '$\sum fx$ = ' and then determine the mean, median and modal scores.

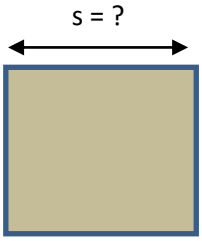
Scores ***(x)***	Frequency ***(f)***	Frequency x scores ***(fx)***
1	2	2
2	3	6
3	2	6
4	1	4
TOTAL	$\sum f = 8$	$\sum fx =$

SL 4

20. Convert the afternoon time shown in the 12-hour clock to 24-hour.

SL 1

21. A square has a perimeter of 36cm. Find the length of one side of the square.



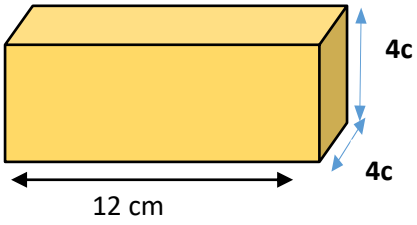
SL 2

22. If 1 inch = 2.5 cm then 20 cm is _____ inches.

SL 1

23. Siala tried to wrap her gift (a u-tube speaker) in a cuboid box shown below.

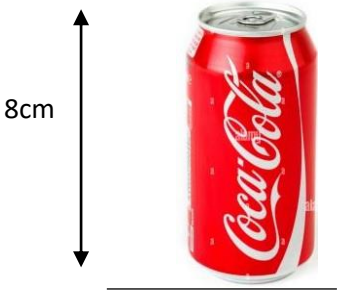
Estimate how much wrapping paper is needed by Siala to wrap her gift.



SL 3

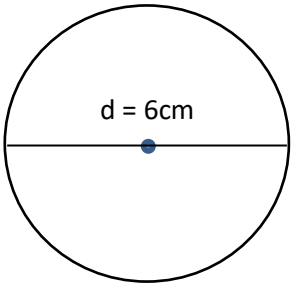
24. Siaki bought a can of coke at Frankie's shop. He wanted to know how heavy in kg is the coke in the can. Determine the total weight of the coke, if an empty can is 0.05kg and one circular surface has a diameter of 6cm. Use π = 3.14.

$[Hint: 1000cm^3 = 1L = 1kg]$



SL 4

25. Calculate the area of the circle below. Use π = 3.

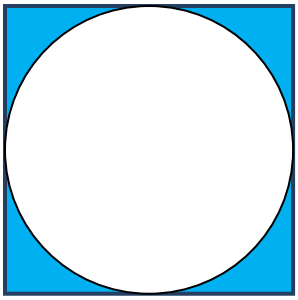


SL 2

26. A cylinder is a 3D made up of 2-circles and one rectangle. The length of the rectangular part of the cylinder is equivalent to:

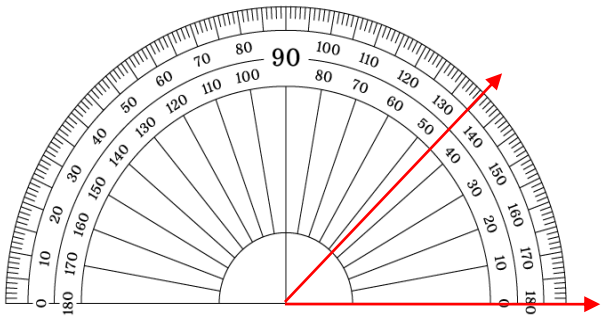
SL 1

27. A circle locked inside a square shape with side length of 10cm each. Determine the shaded area of the figure shown. $[Let\ s = square\ shape\ side\ length\ and\ \pi = 3]$



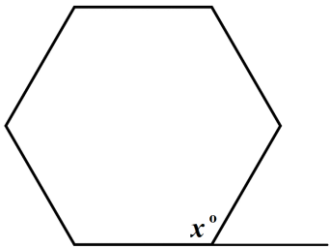
SL 3

28. State the angle measured by the tool shown.



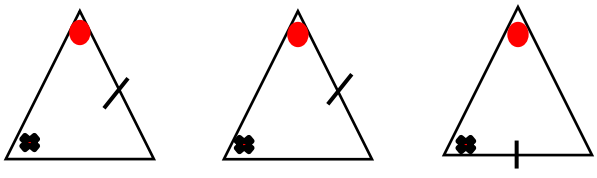
SL 1

29. Using $(n-2)180^0$,find the total interior angle of the regular polygon shown.



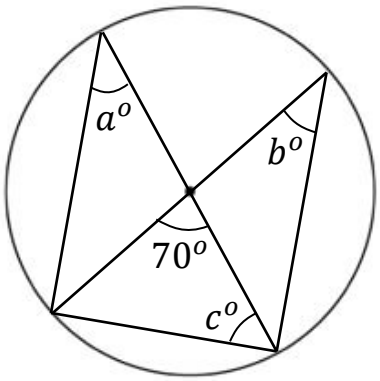
SL 2

30. Apply an appropriate congruency test to pick the odd one out of the three triangles below.



SL 2

31. State with reasons the cyclic angles a, b, c.



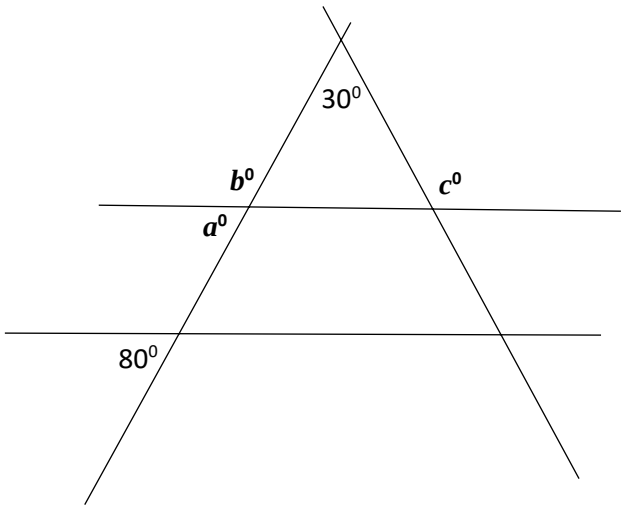
a^0 _____ reason: _____

b^0 _____ reason: _____

c^0 _____ reason: _____

SL 3

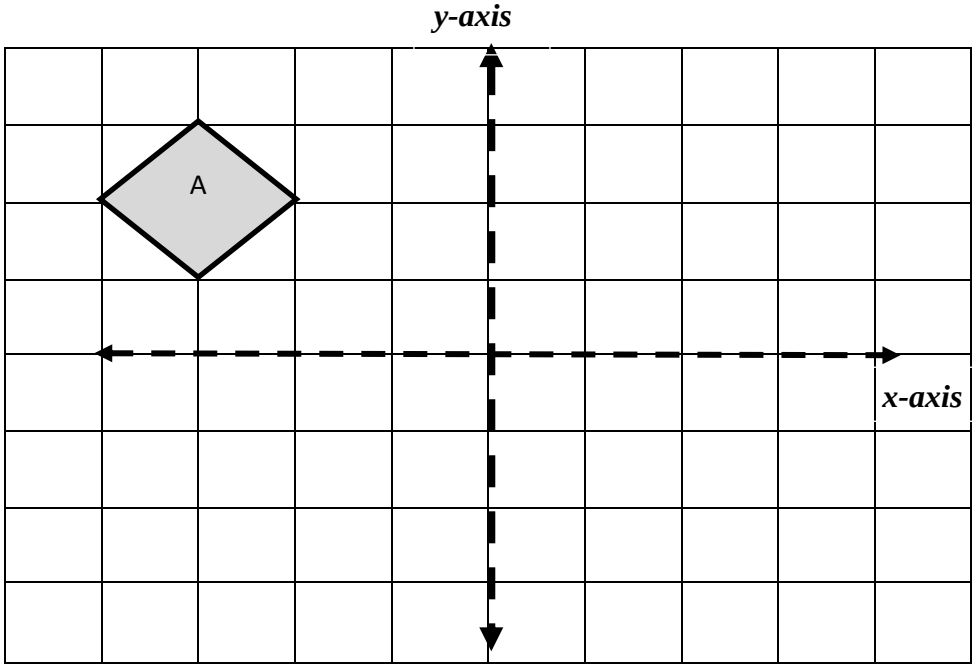
32. Determine with reasons the sizes of angles a, b, c.



SL 3

Angle	Size	Reason
a^o		
b^o		
c^o		

33. Illustrate with accuracy ALL reflections of **object A** using *y* and *x-axis* mirror lines.

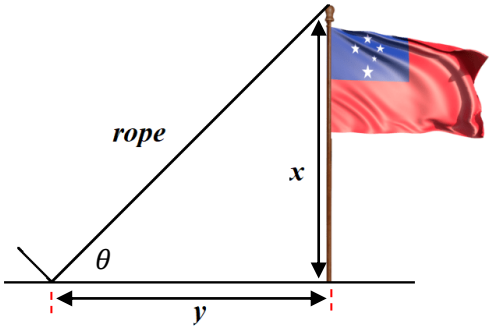


SL 3

34. State the Pythagoras theorem.

SL 1

35. The national flag of Sāmoa was tied to a peg in the ground using a 13m rope.



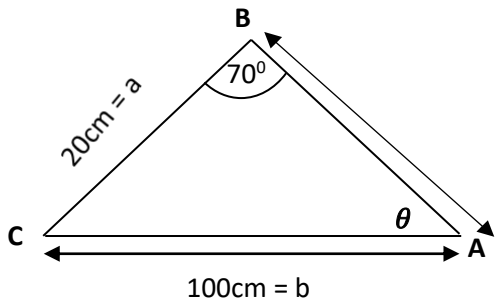
If the angle $\boldsymbol{\theta = 65^0}$, rearrange the appropriate trig-formula to make $\boldsymbol{x}$ the subject to find the height of the flag post.

SL 2

36. State the Cosine rule for non-right angled triangle.

SL 1

37. The triangle ABC is a non-right-angled triangle with 2 sides given and one unknown angle θ . Calculate angle θ in degrees.



SL 3

38. State the type of sequence that the sequence: 8, 13, 18, 23, … represents.

_____

SL 1

39. What would be the 7th term of the sequence in Question 39 above?

_____

SL 1

40. Generate a table of values for the exponential function, $\boldsymbol{y = 20 \times 3^t}$

SL 3

41. Which of the following algebraic equation below represents a quadratic function? Write the letter of your choice in the box provided.

A. $y = \frac{1}{2}x$ *B.* $y = x^2 + x$ *C.* $y = x^3 + 2x$

SL 1

42. Predict the 50th term of the sequence 3, 7, 11, 15……..50th term.
Use the formula: **n^{th} term = 4n -1**

SL 1

43. Use a mapping (or arrow) diagram to show that the relation $\{(-2,1),(0,5),(3,2),(0,-1)\}$ is **NOT** a function.

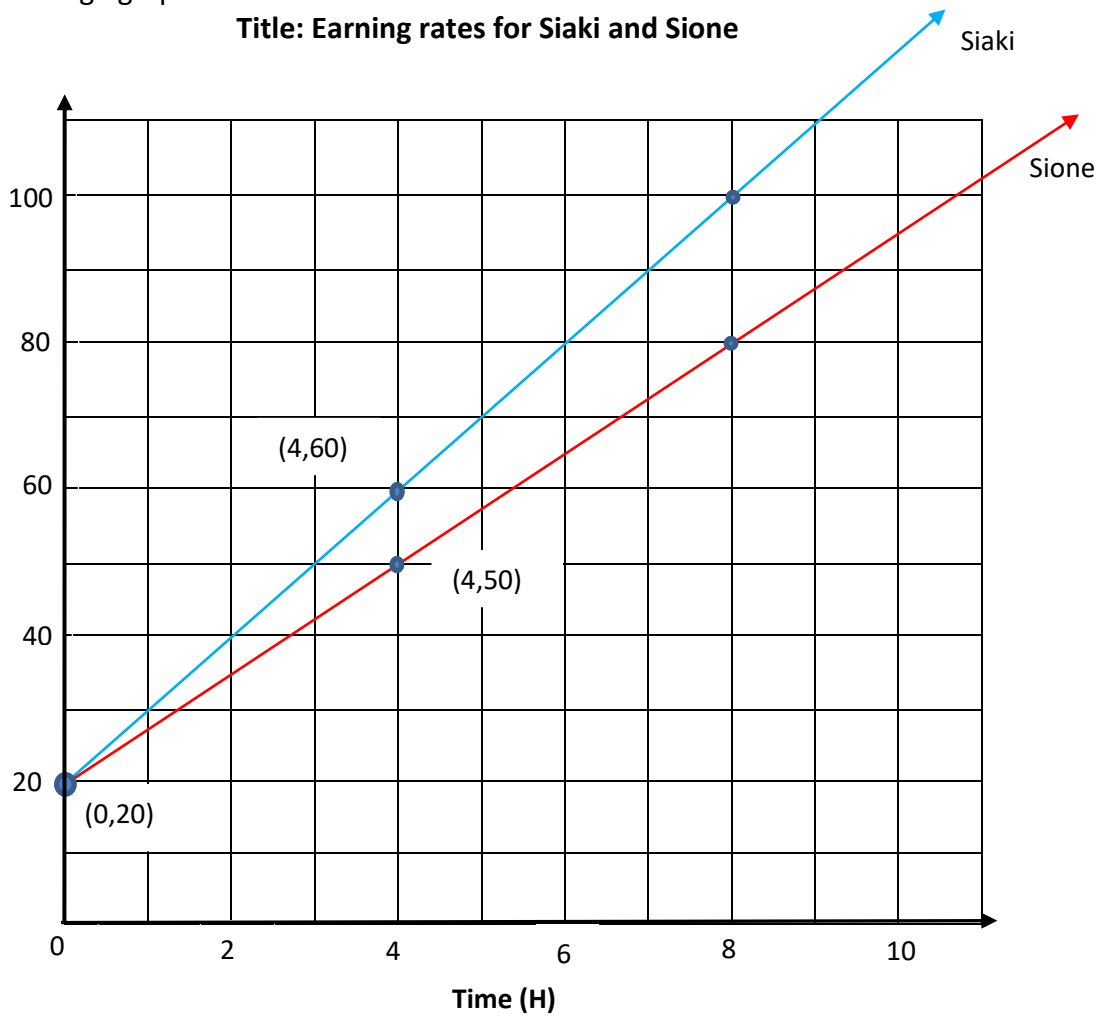
SL 2

44. Compile a table of values for the cubic graphs given to determine their domains and ranges.

(i) $y = x^3$, (ii) $y = 2x^3$ and (iii) $y = 2x^3 + 1$

SL 4

45. Siaki and Sione worked at Frankie Hardware doing different jobs. The graph below represents the rate of change in earnings for Siaki and Sione. Determine earning rates for Siaki (represented by blue line) after hours of work using the information on rate of change graph below.



SL 4

46. Explain the difference in earning rates for Siaki and Sione.

_____

_____

_____

_____

SL 2

STUDENT EDUCATION NUMBER									

MATHEMATICS

2022

(For Scorers only)

STRANDS		Weighting	Scores	Check Scorer	AED Check
STRAND 1	NUMBERS & OPERATIONS	7			
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STRAND 7	RATES OF CHANGE	19			
		100			