

STUDENT EDUCATION NUMBER



GOVERNMENT OF SAMOA
MINISTRY OF EDUCATION, SPORTS AND CULTURE

Samoa School Certificate

MATHEMATICS

2020

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
1. Numbers	2	21	12
2. Algebra	4	71	38
3. Measurements	10	26	15
4. Trigonometry	13	32	18
5. Geometry	17	30	17
TOTAL		180	100

CHECK! This booklet contains pages 2-20 in the right order.
YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

1. Circle one fraction that is equivalent to $\frac{12}{28}$

$\frac{3}{8}$	$\frac{2}{3}$	$\frac{1}{6}$	$\frac{3}{7}$	$\frac{6}{12}$
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SL 1

2. The number 0.000000507 when written in its Standard Form gives:

$0.000000507 = $ <input type="text"/> $ \times 10^{\square}$
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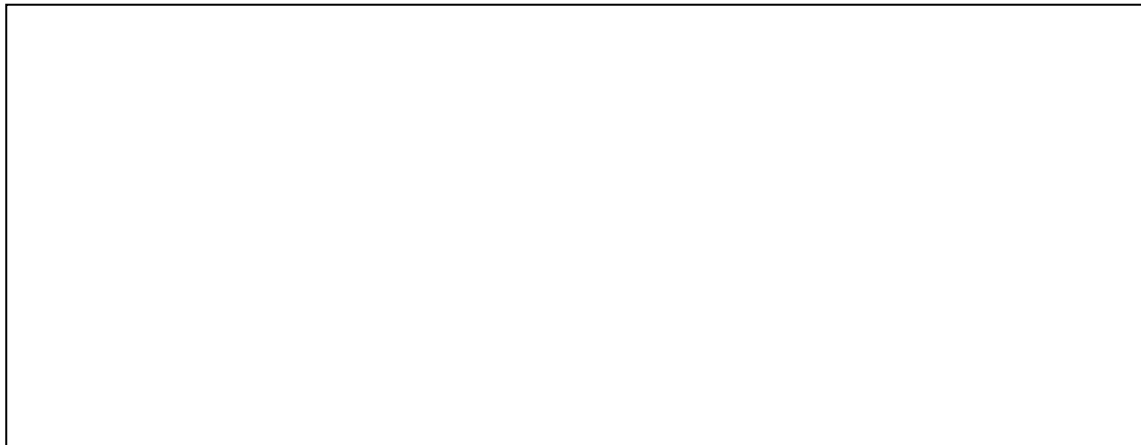
SL 2

3. Increase 352cm by 90%.

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SL 2

4. How many squares with a side of 2.5 cm can fit completely in a rectangle with dimensions of 12.5 cm by 9 cm?



SL 3

5. One rugby team played 16 games throughout the season before lockdown for COVID-19. If this rugby team won 45% of those games, then how many games did they lose? Round your answer to the nearest whole number.



SL 4

6. Name ONE (1) feature of the function, $f(x) = \sqrt{x}$

SL 1

7. Define an exponential function.

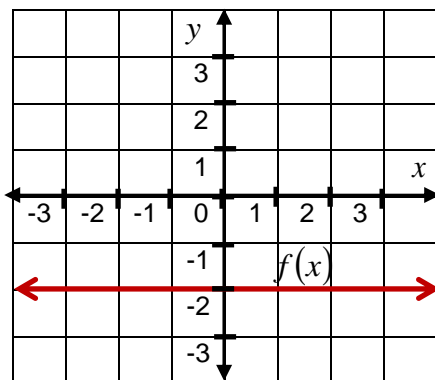
SL 1

8. Which of the four equations given below is a quadratic function?
Tick the box with your choice.

A.	B.	C.	D.
$y = x^3$	$(2x + 1)(x + 3) = 0$	$x \div 10 = 15$	$12x - 4\frac{1}{3} = 0$
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SL 1

9. Write the equation for the function $f(x)$ shown.



Equation _____

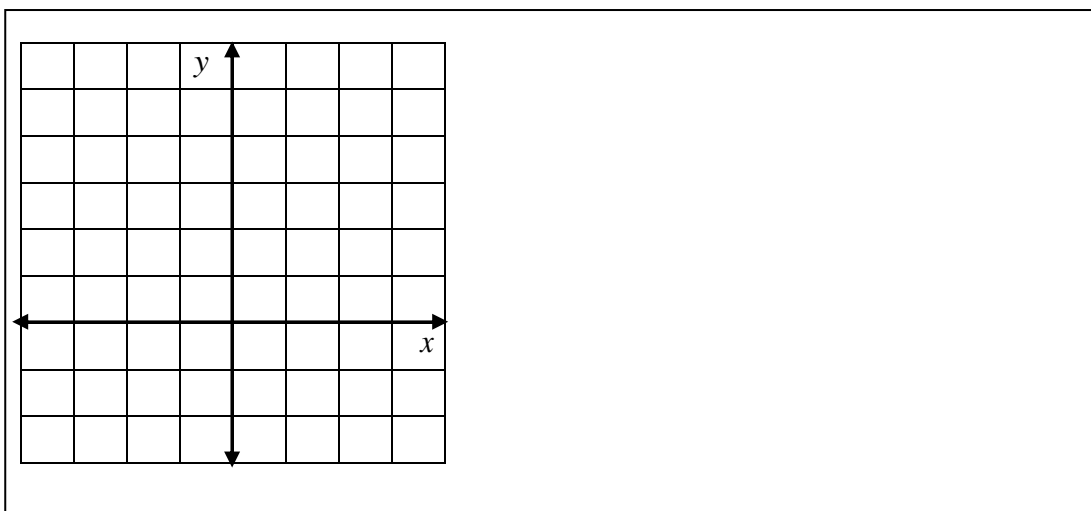
SL 1

10. Express the function $2y = \frac{3x+7}{5}$ in the form of $y = mx + c$

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SL 2

11. Graph the in-equation $y > 2x + 1$ on the Cartesian plane given below.



SL 3

12. In relation to your graph in Number 11, select any point inside the shaded region then show mathematically that it satisfies $y > 2x + 1$.

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SL 2

13. Expand and simplify the expression $(5x+3)(-4-2x)$

SL 3

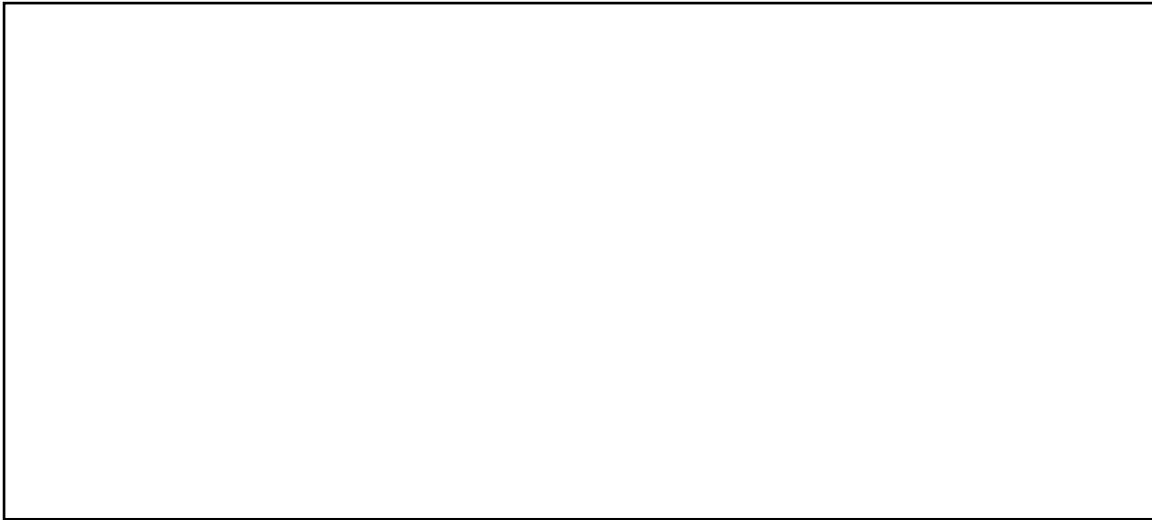
Use the hyperbolic function given below to answer Numbers 14, 15 and 16.

$$y = \frac{6}{x-1} - 2$$

14. Find the x -intercept and y -intercept of the given function.

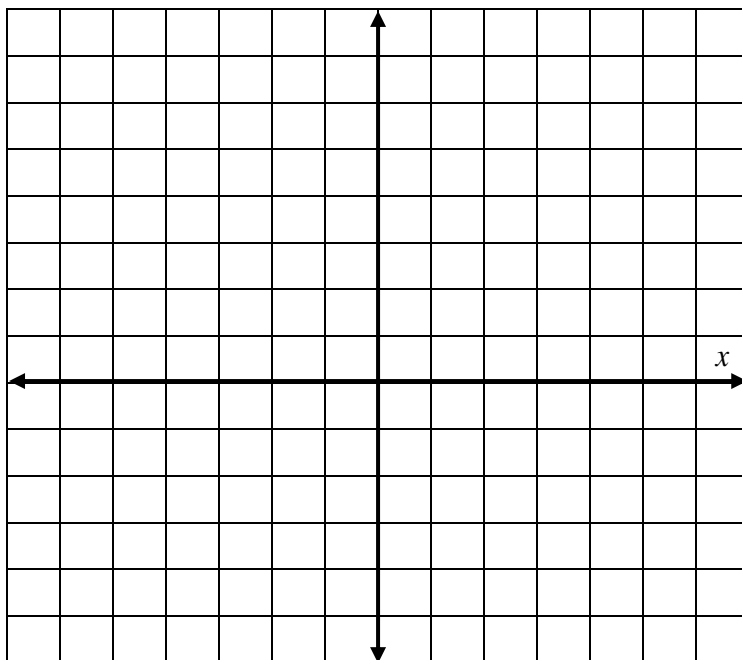
SL 2

15. Find the horizontal and vertical asymptotes of the given function.



SL 2

16. Draw the graph of the given function on the Cartesian plane given below.



SL 4

Use the functions given below to answer Numbers 17 and 18.

$$(1) f(x) = x(x-1)(x+4)$$

$$(2) f(x) = (x+2)^2(x+3)$$

17. When graphed, state ONE (1) major difference of the two functions.

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SL 2

18. Find the roots of the function $f(x) = x(x-1)(x+4)$

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SL 4

19. Solve $\frac{x+12}{5} = \frac{-1}{3}$

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SL 3

20. Use Factor theorem to determine if $(x + 2)$ is a factor of $f(x) = x^3 + 6x^2 + 11x + 6$.

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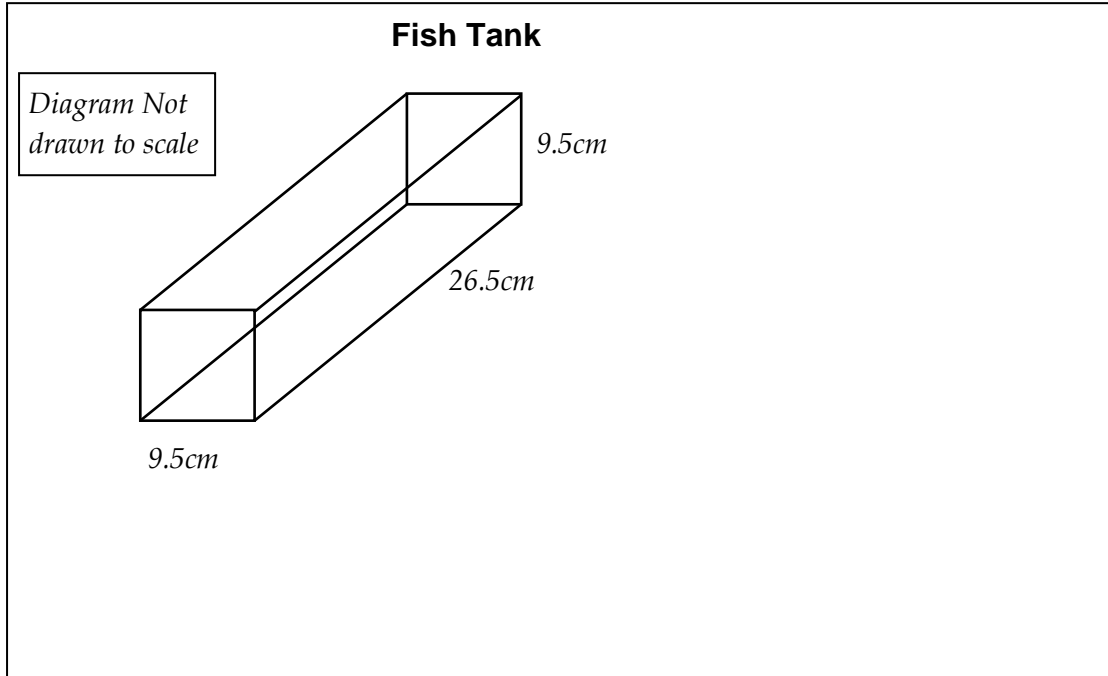
SL 3

21. Suppose the area of a rectangle is 165 square meters and the length is 4 meters longer than the width. Find the length and the width of the rectangle.

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SL 4

22. Find the Volume of the fish tank.



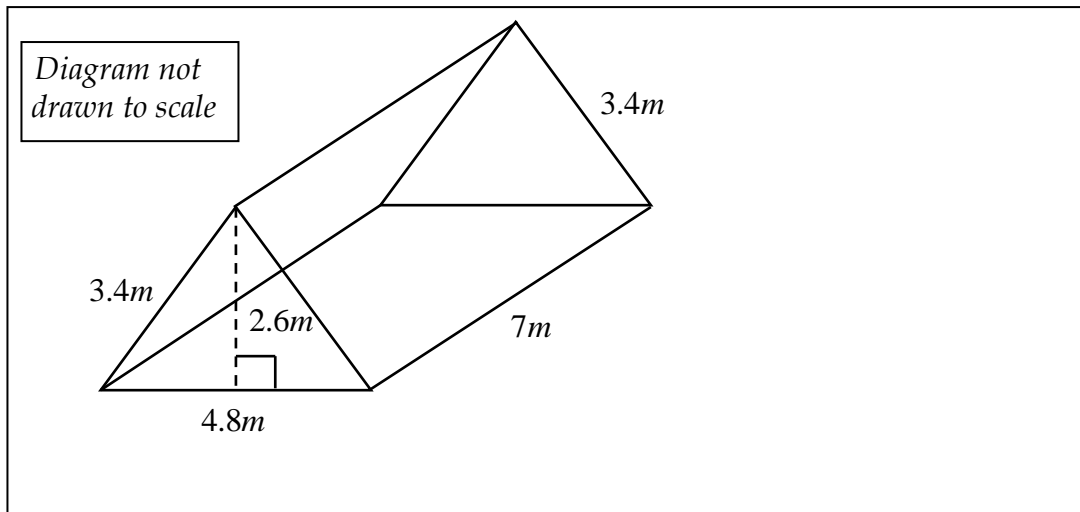
SL 2

23. The total Surface Area of a fair dice is 766.14cm^2 . If x represents one side of the dice, find the value of x .



SL 3

24. Calculate the Surface Area of the given figure.



SL 2

Use the information given below to answer Numbers 25 and 26.

Rizzoli's net pay every fortnight is \$350.00. She offers \$50.00 to her aunt Maura as a gift every two weeks.

25. What fraction of Rizzoli's pay does she give to aunt Maura every two weeks?

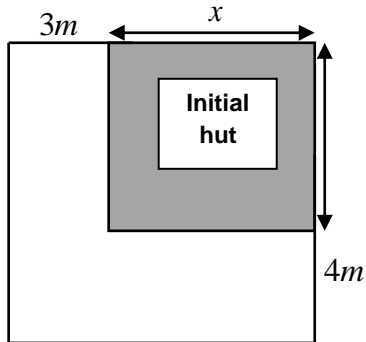
SL 2

26. One fortnight, Rizzoli decided not to give aunt Maura her gift of \$50.00. She spent her pay on a cellphone which costs \$210 including VAGST of 15%. How much VAGST did she pay?

SL 3

27. A squared base hut is expanded by $3m$ and $4m$ as shown in the diagram. If the Area of the extended hut is $132m^2$, find the length of one side of the initial hut.

Diagram not drawn to scale



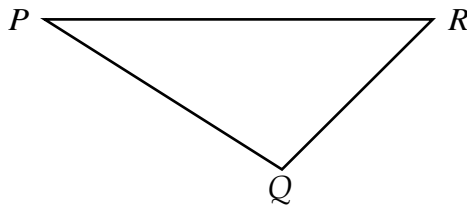
Blank area for student work.

SL 3

Use the information given below to answer Numbers 28, 29 and 30.

The triangle PQR shows a piece of metal ready to be melted by a welder.

Angle PQR is a non-right angle. Side \overline{PQ} is $7.3m$ long, side \overline{QR} is $6.4m$ and \hat{PRQ} is 62° .



28. State the Rule for finding angle QPR.

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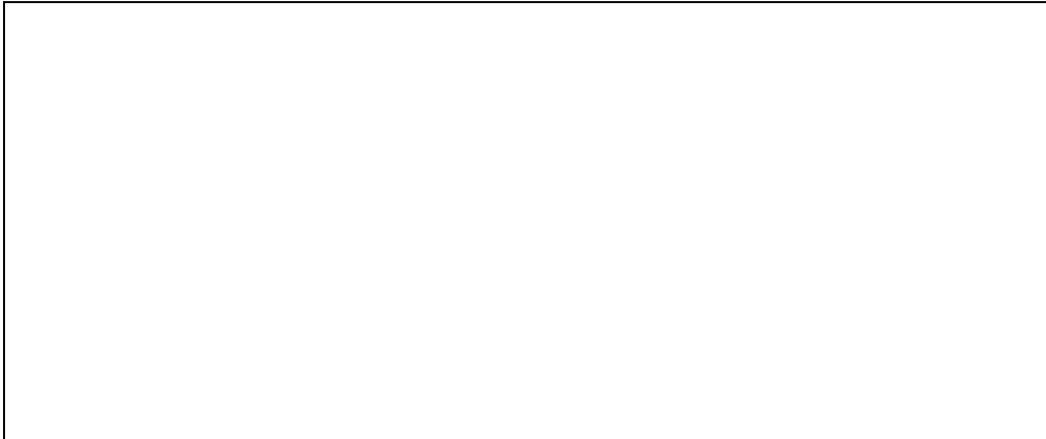
SL 1

29. Use the Rule in Number 28 to find the size of angle QPR.

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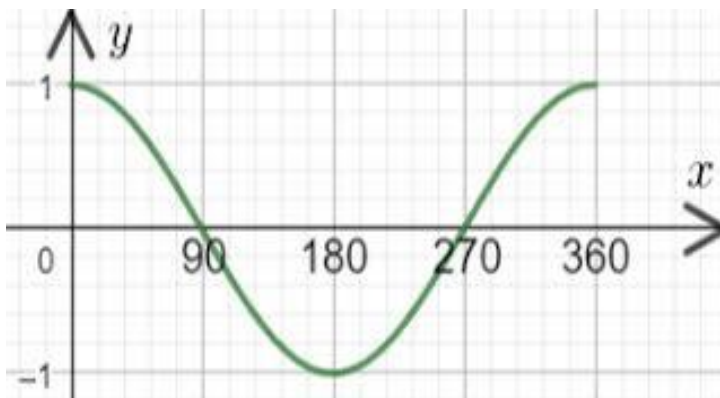
SL 3

30. Calculate the Area of triangle PQR. (Note: $\text{Area} = \frac{1}{2}ab\sin C$)



SL 3

Use the graph below to answer Numbers 31 and 32.



31. What is the name of the graph given above?

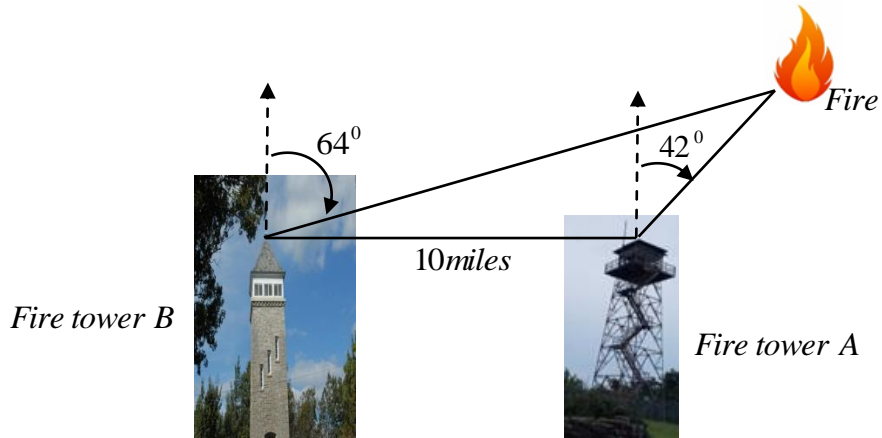
SL 1

32. Determine the coordinates of the intercepts of the graph shown.

SL 2

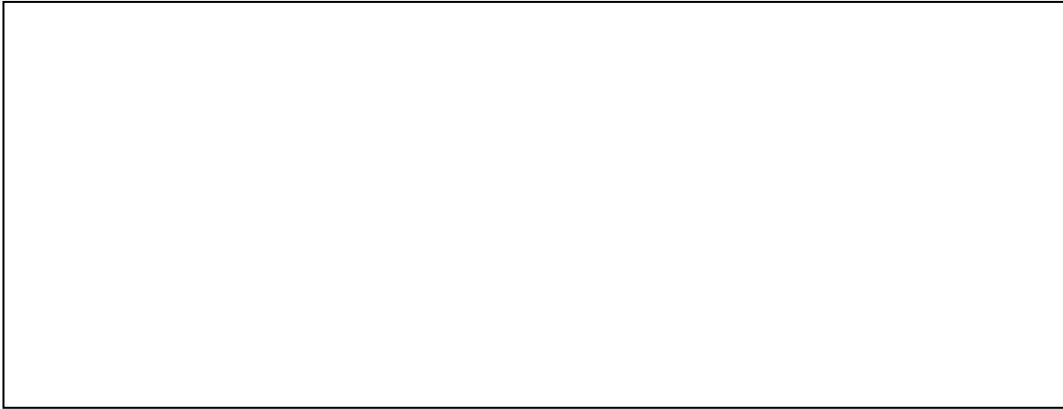
33. Fire towers A and B are located 10 miles apart. Rangers at fire tower A spot a fire at a bearing of 42° , and rangers at fire tower B spot the same fire at a bearing of 64° .

How far from tower A is the fire to the nearest tenth of a mile?



SL 4

34. State the Pythagoras Theorem. Use a diagram to illustrate your answer.



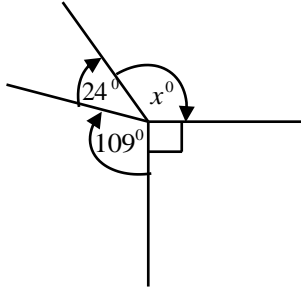
SL 2

35. Sebastian drove his new Land Cruiser from home, going 4 miles south and then 11 miles east. When he got to his destination how far was Sebastian from home?



SL 2

36. Find angle x .



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SL 2

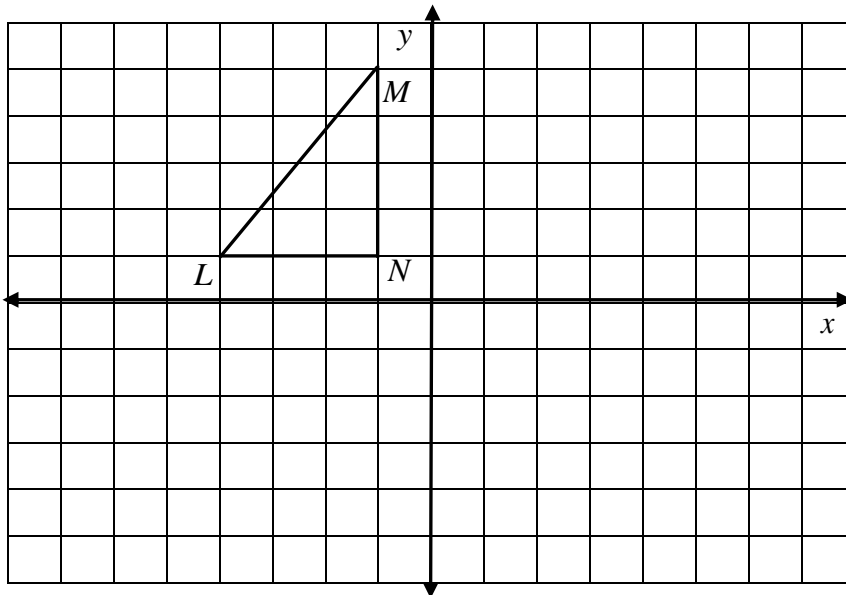
37. The angles of a triangle are in the ratio of 2:3:4. If one angle measures 60° , find the measures of the other two angles.

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SL 2

Use the information given below to answer Numbers 38 and 39.

The figure shown is triangle LMN. Triangle LMN is rotated 90° clockwise about the origin (0,0), to give an image of L'M'N'. Triangle L'M'N' is then rotated 90° clockwise about the origin (0,0) to give an image of L''M''N''.



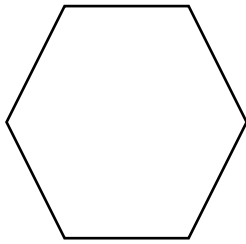
38. On the same set of axes draw and label triangle L''M''N'' the image of LMN after the double rotation.

SL 3

39. State the center, direction and angle of rotation that matches triangle LMN and its image L''M''N''.

SL 3

40. State a property of interior angles of the given polygon.



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SL 1

41. Define an isosceles triangle.

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SL 1

42. State the property of angles on a straight line.

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SL 1

43. Eti wants to build a doll house for his daughter that is proportional to their house. He measured the living room of his house and it is 12 feet by 16 feet. What will be the dimensions of the doll house living room if every foot of the actual house is equal to 0.5 inch in the doll house? Hint: 12 inches = 1 foot

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SL 4

STUDENT EDUCATION NUMBER									

MATHEMATICS

2020

(For scorers use only)

STRANDS	Weighting	Scores	Check Scorer	Double Entry (AED)
STRAND 1: NUMBERS	12			
STRAND 2: ALGEBRA	38			
STRAND 3: MEASUREMENTS	15			
STRAND 4: TRIGONOMETRY	18			
STRAND 5: GEOMETRY	17			
TOTAL	100			