



GOVERNMENT OF SAMOA

STUDENT EDUCATION NUMBER									

Samoa National Junior Secondary Certificate

GENERAL MATHEMATICS 2023

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 – 3	15	10
STRAND 2	ALGEBRA	4 – 7	35	21
STRAND 3	STATISTICS & PROBABILITY	8 – 10	25	14
STRAND 4	MEASUREMENTS	11 – 14	30	19
STRAND 5	GEOMETRY	15 – 17	25	12
STRAND 6	TRIGONOMETRY	18 – 19	15	7
STRAND 7	RATES OF CHANGE	20 – 23	35	17
TOTAL			180	100

Check that this booklet contains pages 2-24 in the correct order and that none of these pages are blank.

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

For Question 1, choose and write the LETTER of the correct answer in the box provided.

1. The recurring decimal 0.222..., can be written as the following fraction.

A. $\frac{2}{10}$

B. $\frac{2}{9}$

C. $\frac{22}{10}$

D. $\frac{222}{1000}$

SL 1

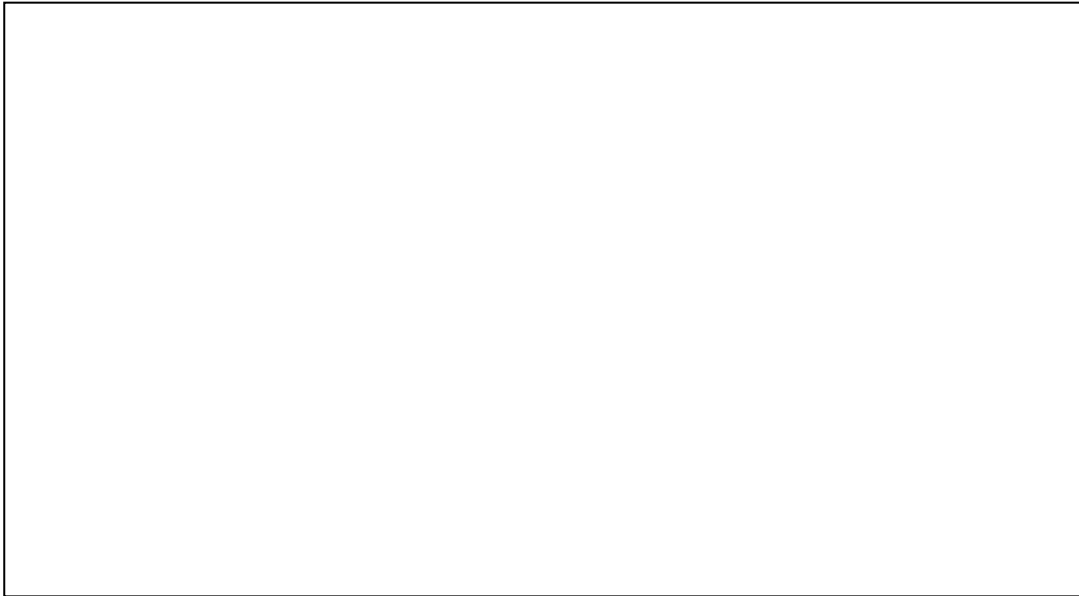
2. Convert the decimal 0.000028 into scientific notation.

SL 2

3. Evaluate and simplify the expression $25^0 \times 49^{\frac{1}{2}}$

SL 3

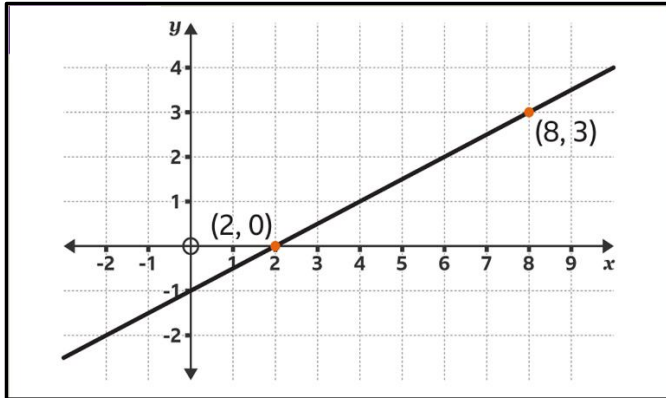
4. The shadow of a tree with a height of 9m is 6m. If the shadow of another tree measured at the same time is 34m, find the height of this other tree.



SL 4

For Questions 5 to 7, choose and write the LETTER of the correct answer in the box provided.

5. Identify the x-intercept and the y-intercept of the given graph.



- A. x-intercept = -1, y-intercept = 2
B. x-intercept = 2, y-intercept = -1
C. x-intercept = 2, y-intercept = 3
D. x-intercept = 8, y-intercept = -1

SL 1

6. The y-coordinate of a point on the parabola $y = -3x^2$, with an x-coordinate = -2 is;

- A. y-coordinate = 12
B. y-coordinate = 18
C. y-coordinate = -12
D. y-coordinate = 6

SL 1

7. Which point lies on the parabola $y = (x + 7)(x - 3)$?

- A. (3, 19)
B. (3, 0)
C. (3, 10)
D. (3, 4)

SL 1

8. Simplify $\frac{x}{5} + \frac{x}{4}$

SL 2

9. Rearrange the equation $6x + 2y - 8 = 0$, to the gradient intercept form.

SL 2

10. Sebastian is 4 years younger than Samantha. Val is 5 times as old as Samantha. The sum of their ages is 80. Write an equation for this.

SL 3

11. Factorise $3a^2 - 27ab$

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SL 3

12. Catherine has \$500 in a savings account in the beginning of 2023. She wants to have at least \$200 in the account by the end of 2023. She withdraws \$25 every week for food and clothes. Calculate the number of weeks that Catherine can withdraw money from her account.

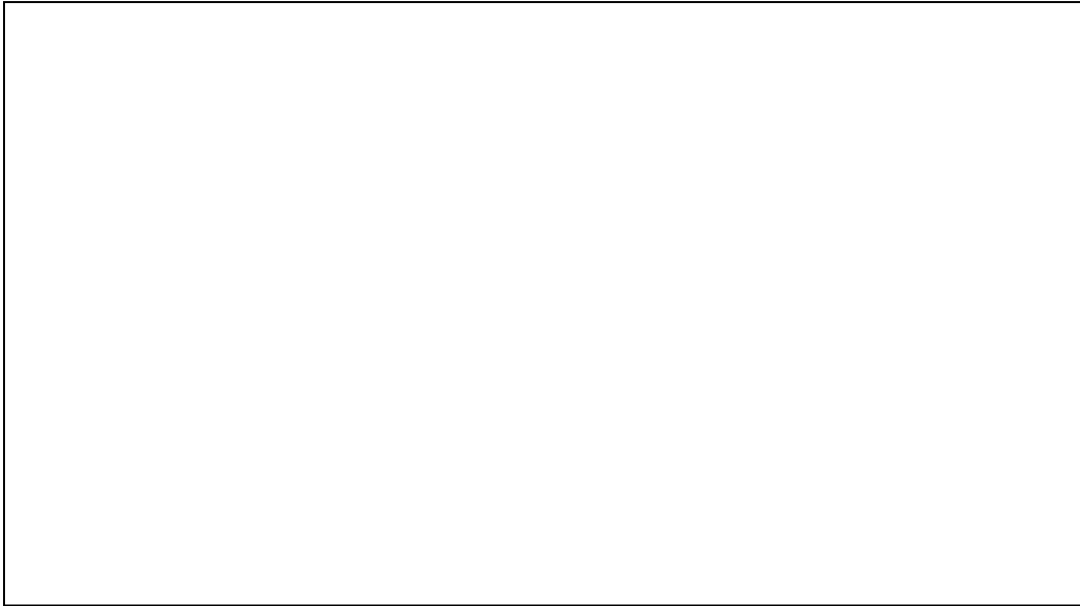
Hint: Let w be the number of weeks

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SL 4

13. When the SSAB delivery truck is called, the cost of the service is \$10 plus \$1 per mile that the stock must be delivered. Write and graph a linear equation to represent the total cost of the delivery service, which is dependent on the number of miles between the SSAB store and place where the stock is delivered to.

Hint: y = cost of the delivery service in dollars
 x = the number of miles the truck covered to deliver the stock



SL 4

For Questions 14 to 16, choose and write the LETTER of the correct answer in the box provided.

14. What will be the probability of losing a game if the winning probability is 0.4?

- A. 0.5
- B. 0.6
- C. 0.7
- D. 0.8

SL 1

15. What is the probability of the pointer landing on an odd number when the given spinner is spun?

- A. $\frac{2}{10}$
- B. $\frac{3}{10}$
- C. $\frac{1}{2}$
- D. $\frac{5}{9}$



SL 1

16. Which of the following is the benefit of using simple random sampling?

- A. The results are always representatives.
- B. Interviewers can choose respondents freely.
- C. Informants can refuse to participate.
- D. The accuracy of the results can be calculated.

SL 1

17. List all possible outcomes when a coin is tossed twice.

SL 2

18. Three athletes compete in a 200m race. Their times for 3 heats were recorded as shown in the table below.

Athletes	Race Times (seconds)		
	Heat 1	Heat 2	Heat 3
Joshua	52	53	54
Sebastian	50	49	55
Christian	58	50	52

Who has the fastest average time across the 3 Heats?

SL 2

19. The boys' and girls' basketball teams at a secondary school had their heights measured at practice. The results are shown below in the back-to-back stem and leaf diagram.

Girls		Boys
5	14	
7, 5, 5, 4	15	3, 8, 9
8, 4, 2, 1	16	2, 5, 7, 8
6, 4, 2, 1, 0	17	0, 2, 3, 6, 7

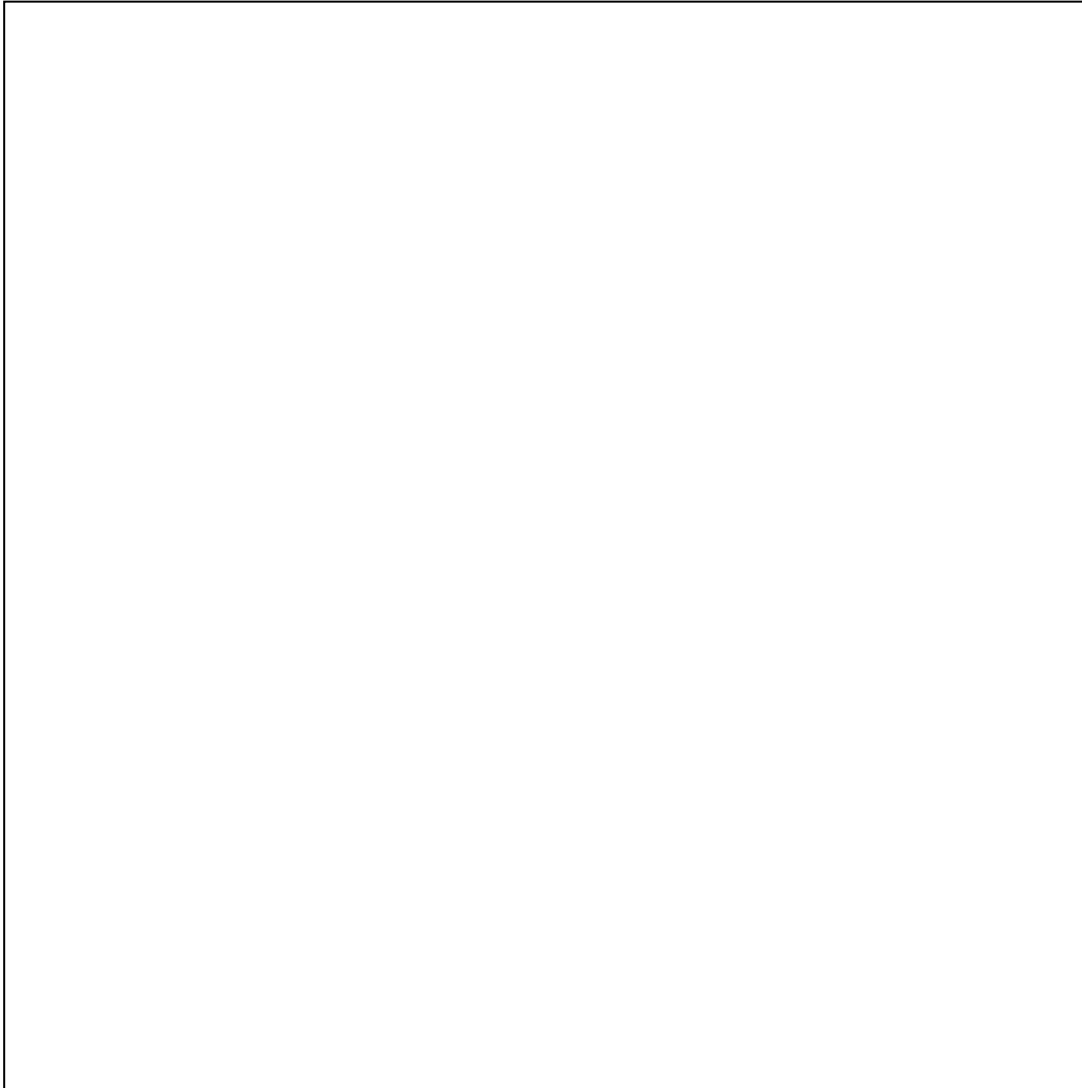
Compare the median values for the two teams and comment on their heights.

SL 3

20. Every four years, soccer teams from around the world compete in the World Cup. The following list shows the number of goals scored in the championship game of each World Cup from 1966 – 2022.

6, 6, 3, 4, 4, 5, 1, 5, 3, 2, 7, 1, 1, 6, 6

Organise the scores in a Frequency Table and display in a Dot Plot.



SL 4

For Questions 21 to 23, choose and write the LETTER of the correct answer in the box provided.

21. Convert $1,000\text{cm}^2$ to m^2

- A. 100m^2
- B. $1,000,000\text{m}^2$
- C. 0.1m^2
- D. $1,00,000\text{m}^2$

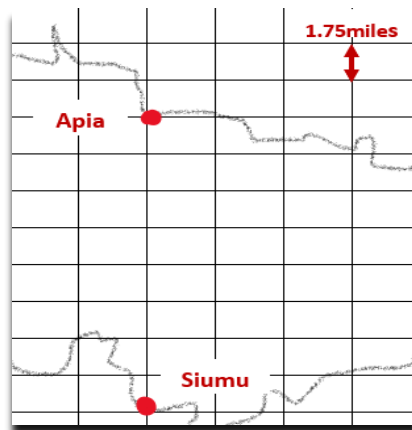
SL 1

22. What will be the smallest possible measurement and the biggest possible measurement for a 54cm , measured to the nearest cm ?

- A. Lower bound 53.9cm & Upper bound is 54.1cm
- B. Lower bound 54.5cm & Upper bound is 53.5cm
- C. Lower bound 53.1cm & Upper bound is 54.9cm
- D. Lower bound 53.5cm & Upper bound is 54.5cm

SL 1

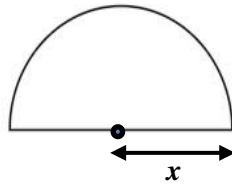
23. Below is part of the map of Upolu Island. What is the actual distance between Apia and Siumu marked on the map.



- A. 14miles
- B. 22miles
- C. 13.3miles
- D. 22.3miles

SL 1

24. The semicircle shown below has an Area of 18cm^2 . If the formula to find the Area of this semicircle is $Area = \frac{\pi \times r^2}{2}$, calculate the radius x of the semicircle. (Use $\pi = 3$)



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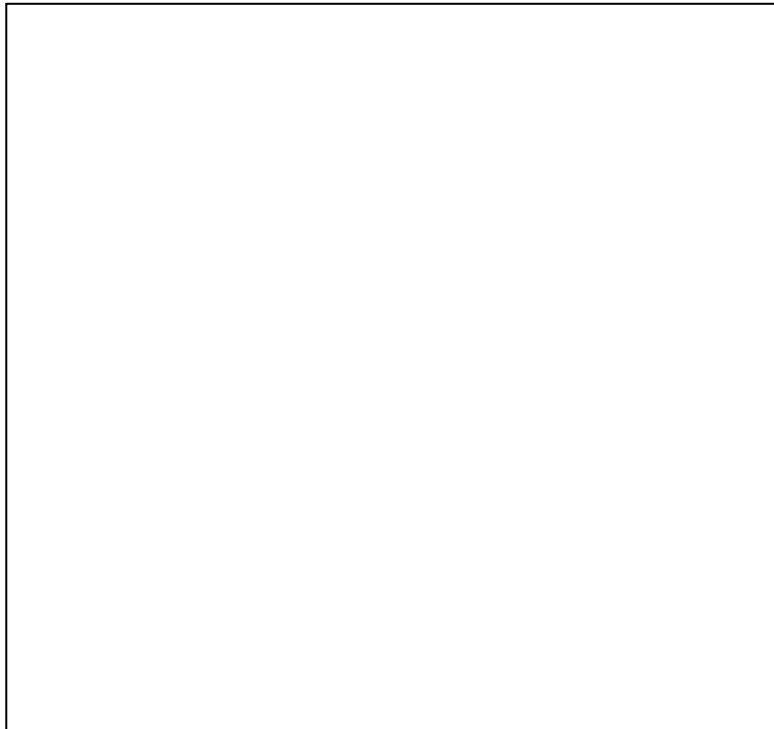
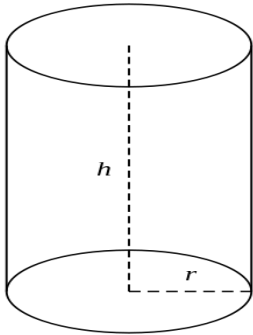
SL 2

25. A circle has a diameter of 140cm. Find the circumference of the circle. (Use $\pi = 3$)

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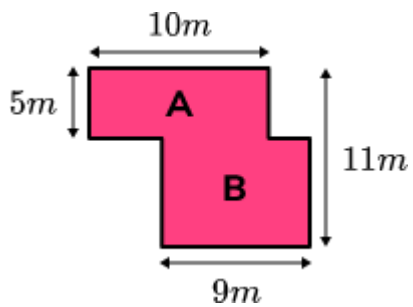
SL 2

26. The 6m^3 of concrete is made into the shape of a cylinder. The base has a radius of 0.5m . Work out the height of the cylinder. Use $\pi = 3$. $Volume = \pi r^2 h$



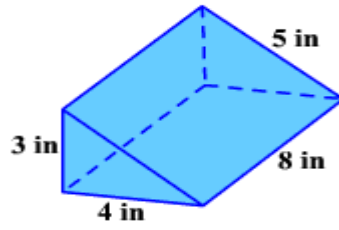
SL 3

27. Find the area of the composite figure below.



SL 3

28. Find the Surface Area of the figure below.



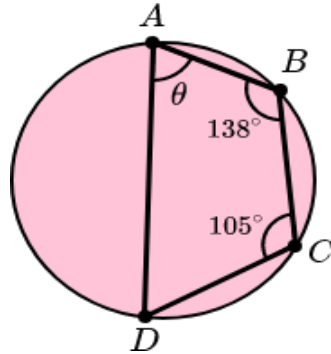
SL 3

29. Find the length of one side of a square whose perimeter is 24cm.

SL 3

For Question 30, choose the BEST answer and write the correct letter in the box provided.

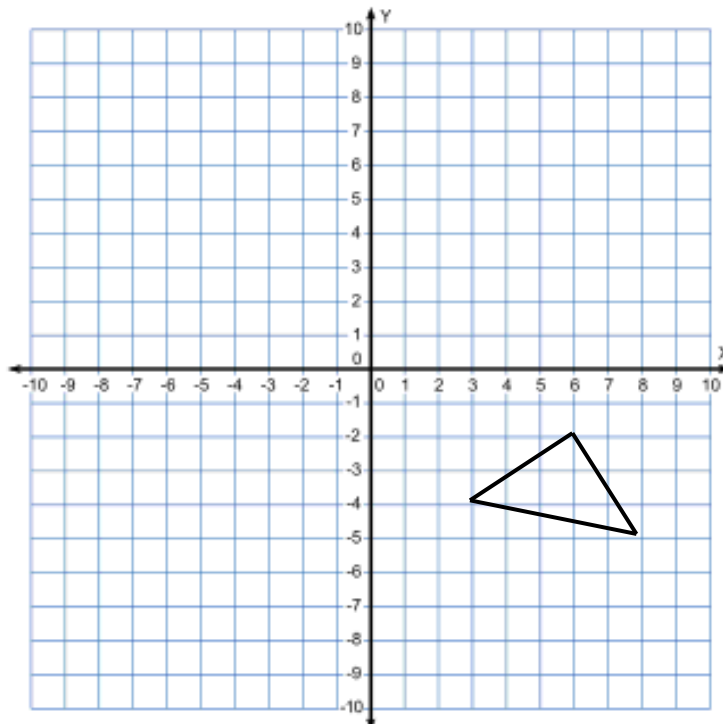
30. In the figure below, the angle $BCD = 105^\circ$ and angle $ABC = 138^\circ$. If the figure is a cyclic quadrilateral, what will be angle θ ?



- A. 180°
- B. 75°
- C. 42°
- D. 85°

	SL 1

31. Translate the triangle twice using vector $\begin{pmatrix} -4 \\ 4 \end{pmatrix}$

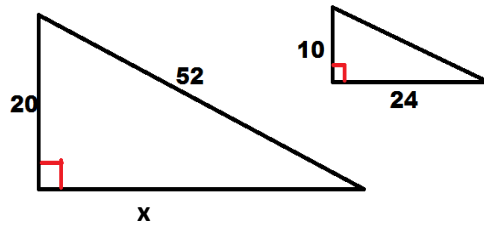


SL 2

32. The interior angles of a pentagon are x° , x° , $2x^\circ$, $2x^\circ$ and $2x^\circ$. Write an equation that shows the total angles of the pentagon.

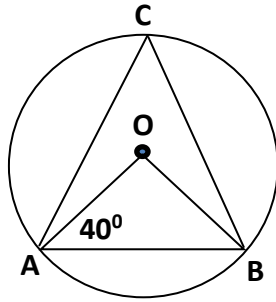
SL 2

33. The two triangles are similar. Work out the value of side x .



SL 3

34. In the given figure, O is the Centre of a Circle. If $\angle OAB = 40^\circ$ and C is a point on the circle. Find $\angle ACB$.

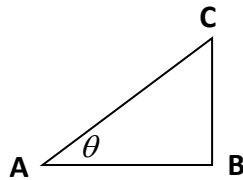


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SL 4

For Questions 35 and 36, choose and write the LETTER of the correct answer in the box provided.

35. The sides of a right-angled triangle are labelled with respect to the marked angle. What are the names for side **AB**, side **BC** and side **AC**?



- A. Hypotenuse, Opposite and Adjacent
 B. Adjacent, Opposite and Hypotenuse
 C. Opposite, Hypotenuse and Adjacent
 D. Adjacent, Hypotenuse and Opposite

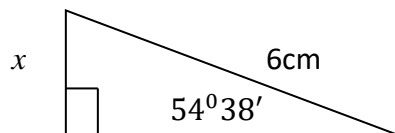
SL 1

36. One of the trigonometric ratios to find an unknown angle of a right-angled triangle is $\text{Cosine } \theta = \frac{\text{adjacent side}}{\text{hypotenuse side}}$. If the adjacent side is 3.5cm and hypotenuse is 6cm, what will be the value of θ in one decimal place?

- A. 98°
 B. 98.8°
 C. 97.0°
 D. 98.2°

SL 1

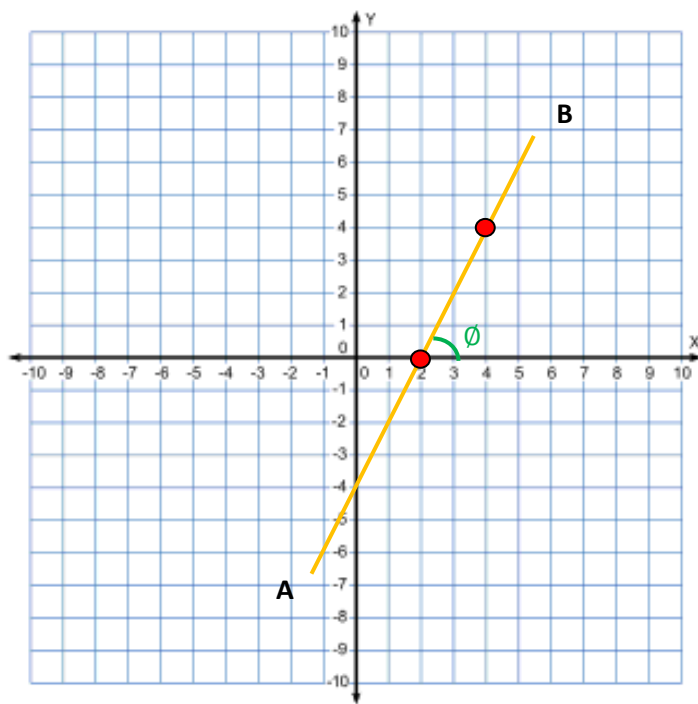
37. Use formula $\text{Sine } \theta = \frac{\text{Opposite}}{\text{hypotenuse}}$ to find side x of the triangle in 1 significant figure.



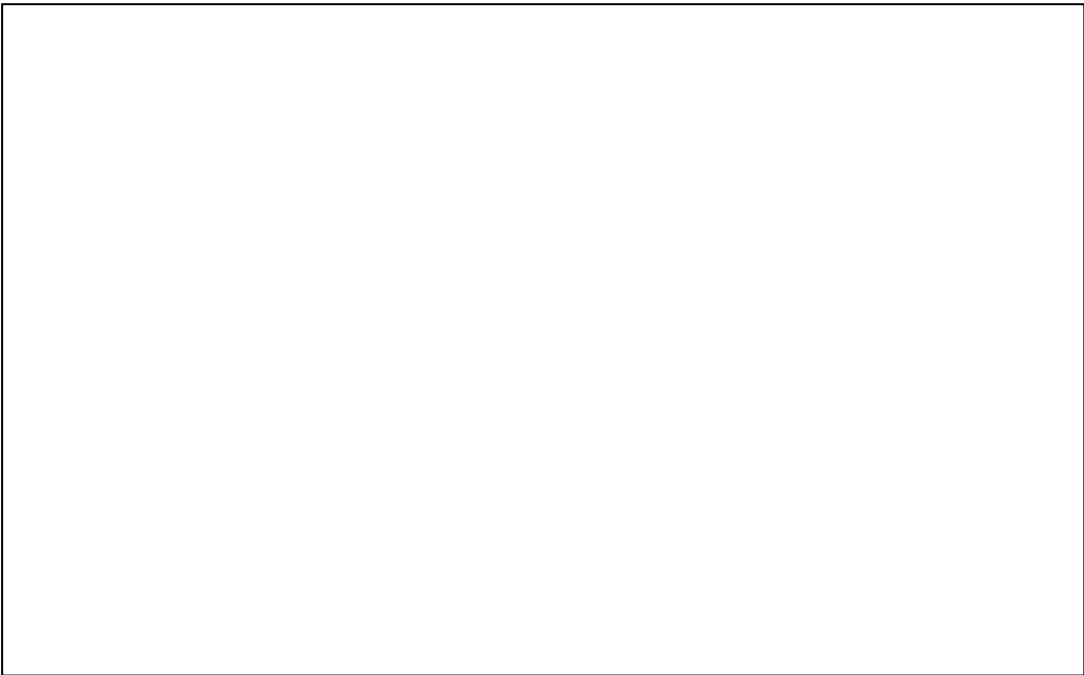
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SL 2

38. Find the angle θ between line AB and the x-axis.

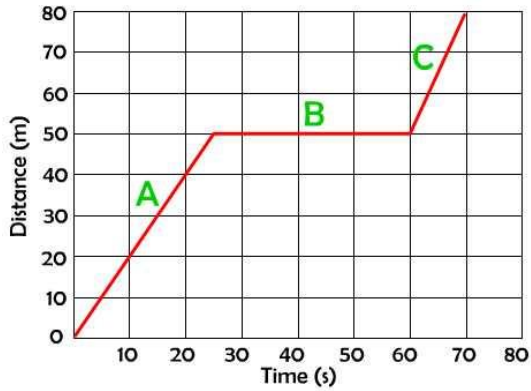


SL 3



For Questions 39 to 41, choose and write the LETTER of the correct answer in the box provided.

39. The graph shown below is a distance versus time graph for a moving object. What is its speed between 25 and 60 seconds?



- A. 4m/s
- B. 0m/s
- C. 2m/s
- D. 5m/s

SL 1

40. Calculate the rate of change for the height of the tree as shown in the table.

Time (in days)	Height of the tree (in inches)
50	4
140	7

- A. 0.008 inches/day
- B. 0.05 inches/day
- C. 0.033 inches/day
- D. 0.058 inches/day

SL 1

41. In the following sequence 2, 10, 50, 250, the next three numbers will be:

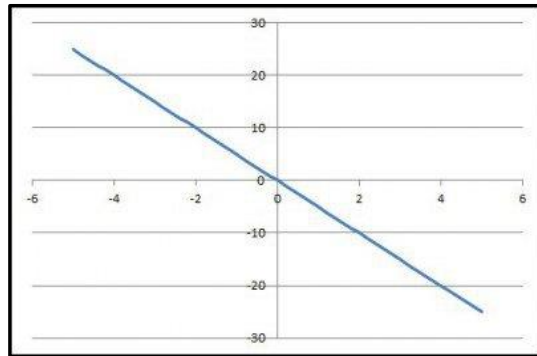
- A. 2000, 10500, 3600
- B. 1800, 6400, 32000
- C. 1500, 6500, 35000
- D. 1250, 6250, 31250

SL 1

42. Match the type of gradient with its corresponding graph.
Choose the correct graph and write the letter in the box provided.

Positive gradient

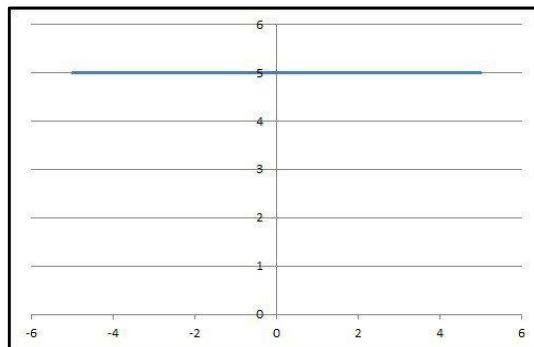
A.



SL 3

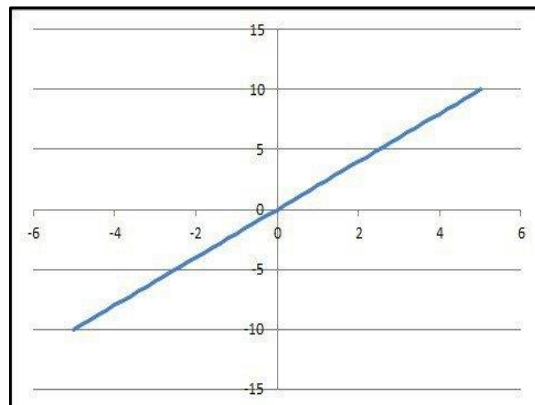
Negative gradient

B.



Zero gradient

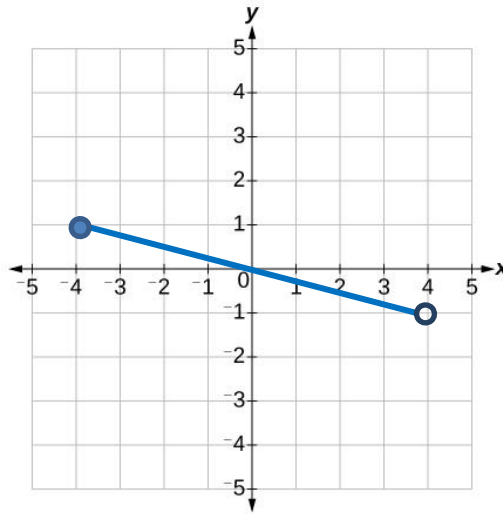
C.



43. Determine the n^{th} Term of the sequence 6, 11, 16, 21, 26.....

SL 3

44. Write the Domain and Range of the graph in set builder notation.



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SL 2

45. Find the next term in the sequence given. $-8, -5, -2, \underline{\hspace{2cm}}$

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SL 2

46. Gasoline costs have experienced some fluctuations over the last several decades. The table lists the average cost, in dollars, of a gallon of gasoline for the years 2008 – 2012. The cost of gasoline is considered as a function of year.

y	2008	2009	2010	2011	2012
Cost(y)	3.30	2.41	2.84	3.58	3.68

Find the average rate of change of the cost of gasoline from 2008 – 2012.

SL 4

STUDENT EDUCATION NUMBER									

SNJSC GENERAL MATHEMATICS

2023

(For Scorers only)

STRANDS		Weighting	Scores	Check Scorer	AED Check
STRAND 1	NUMBERS & OPERATIONS	10			
STRAND 2	ALGEBRA	21			
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STRAND 6	TRIGONOMETRY	7			
STRAND 7	RATES OF CHANGE	17			
		100			