



# Minuwangoda Education Zone

## Second Term Evaluation - 2023

Grade -10

Mathematics II

Name: .....

Time: 3 hours

### Part A

Answer 5 questions from Part A and 5 questions from Part B.

01)(a)

- i. Fill in the blanks of the table prepared for the function  $y = x^2 - 9$  for the given  $x$  value range.

$x$	-4	-3	-2	-1	0	1	2	3	4
$y$	7	0	.....	-8	-9	-8	.....	0	7

- ii. Draw the graph of the above function by take 10 small squares as 1 unit along  $x$  axis and 10 small squares as 2 units along  $y$  axis.

(b) By using the graph

- Write the coordinates of minimum point.
- Find the value of  $x$ , when  $y = 0$
- Write the range of the function which the graph decrease negatively.

02) It is estimated that 8 workers take 9 days to put fertilizer for coconut plants in an estate. The daily wage of a worker is Rs.2500

- Find the total work in man days.
- Find the total amount needed to pay as wages for the whole task.
- After working 3 days 2 workers got sick and they were absent. Find the additional days needed to complete the task from remaining workers.

03) Following table illustrates the information collected from water pumping station regarding the daily water usage.

Water usage (units)	Number of customers (f)
4	4
5	7
6	8
7	11
8	15
9	13
10	9
11	3

- Find the number of customers who took water from this water pumping station per day.
- Find the average daily water usage of one customers in to the first decimal place.
- By taking that 1 unit is 25 litres, calculate the amount of water that is expected to supply from this pump station during a month in litres.

04)

a) Solve  $\frac{3}{a+1} = \frac{1}{a-3}$

b) 300 tickets have been issued for an exhibition. Tickets are priced at Rs.20 and Rs.50. The total income earned by selling tickets is Rs.9000

- i. Take the number of Rs.20 tickets as  $x$  and number of Rs.50 tickets as  $y$ , construct a pair of simultaneous equations.
- ii. By solving above simultaneous equations find the number of Rs.20 tickets and Rs.50 tickets separately.

05) Simplify

a)  $\frac{1}{x+1} - \frac{2}{x+3}$

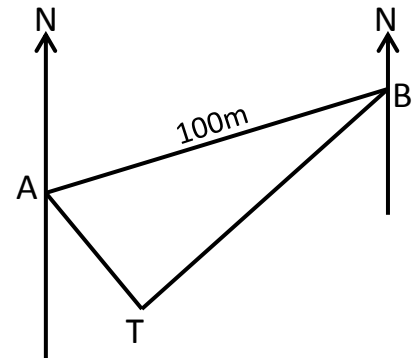
b)

- i. Length of the given flower bed is 4m more than its breadth. Area of the flower bed is  $45m^2$ . Construct a quadratic equation by taking the breadth of the flower bed as  $x$ .
- ii. By solving the quadratic equation find the breadth of the flower bed.



06) The sketch of a horizontal floor is given below.

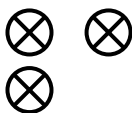
- a) The bearing of the tree T from A is  $110^\circ$ . The point B is located 100m away from A and the bearing of B from A is  $060^\circ$ . The bearing of T from B is  $200^\circ$ 
  - i. Copy the diagram and calculate the magnitudes of the angles  $\hat{BAT}$  and  $\hat{ABT}$
  - ii. Show that  $\hat{ATB} = 90^\circ$



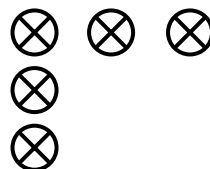
b) Find  $\sqrt{3.61}$  using the division method

**Part B**

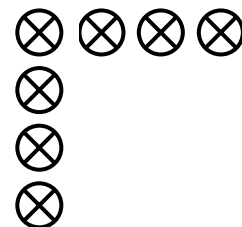
07) Answer the given questions by using below dot patterns.



Pattern I



Pattern II



Pattern III

- i. Draw 4<sup>th</sup> dot pattern
- ii. Write first four terms of given patterns
- iii. Find the general term ( $n^{th}$  term) of this pattern
- iv. Which term is indicate using 51 dots
- v. Show that a another pattern is formed by adding each 2 consecutive terms from first term.

08)  $\hat{A}BC = 45^\circ$ ,  $BC = 8\text{cm}$  and  $\hat{B}AC = 60^\circ$  of the triangle ABC

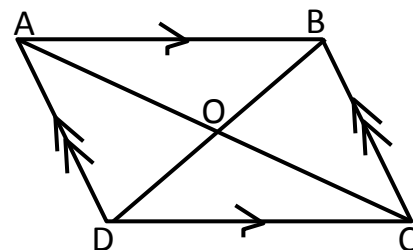
- Construct the triangle ABC
- Construct a perpendicular from A to BC. Name the point it intersects with the line BC as P.
- Construct the locus of the points that move equidistance to A and C. Name the point it meet with the line AC as R.
- Name the point that meet the perpendicular drawn at (ii) and the locus of (iii) as Q
- Show that  $\hat{P}QR + \hat{P}CR = 180^\circ$

09)

- Find the value  $\log_{10} 20 + \log_{10} 10 - \log_{10} 2$
- Solve  $\log_2 5 + \log_2 3 = \log_2 x$
- Find the value using a logarithms table,  $\frac{73.12 \times 25.41}{18.32}$

10) The diagonals of the quadrilateral ABCD intersect perpendicularly at O.  $AC = 24\text{cm}$  and  $BD = 18\text{cm}$

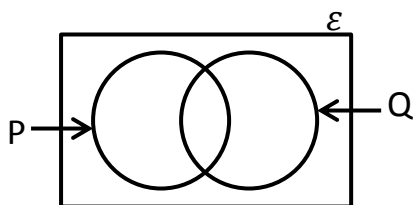
- Find the length of AO
- Find the length of BO
- Find the length of AB
- Find the length of BC
- Calculate the perimeter of the quadrilateral ABCD
- Write suitable special name quadrilateral ABCD



11)  $\epsilon = \{\text{Whole numbers from 1 to 10}\}$

$P = \{\text{Triangular numbers between 0 and 10}\}$

$Q = \{\text{Square numbers between 0 and 10}\}$



- Write the elements of the set of  $\epsilon$
- Write the elements of the set of P
- Write the elements of the set of Q
- Include above information in the given Venn diagram
- Write the elements of  $P \cap Q$

12) A is the right angle of the isosceles triangle ABC. The perpendicular drawn from A to BC is AD,

- Draw suitable diagram and include the given data
- Show that triangle ADC and triangle ADB are congruent.
- Show that " $\frac{1}{2}$  area of triangle ABC = Area of triangle ADC"