පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව - උතුරු මැද පළාත
மாகாணக் கல்வித் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION – NORTH CENTRAL PROVINCE

Third Term Test - 2023

Grade: 10

Subject :- **Mathematics - I**

School Name : .....

Index Number : .....

Time : 2 hours

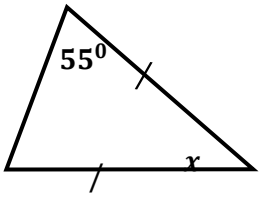
Part - A

Write the answers to all questions on the paper itself.

1. $\log_2 8 = 3$ .Write in index notation.

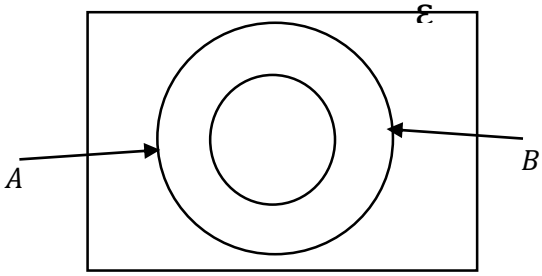
2. The capacity of a tank is 1250***l.*** How many minutes will it take to fill the tank completely with water flowing at a uniform rate of 50 liters per minute?

3. Find the value of the angle $\boldsymbol{x}$ represented in the figure.



4. Find the value of $\sqrt{17}$ by the first approximation.

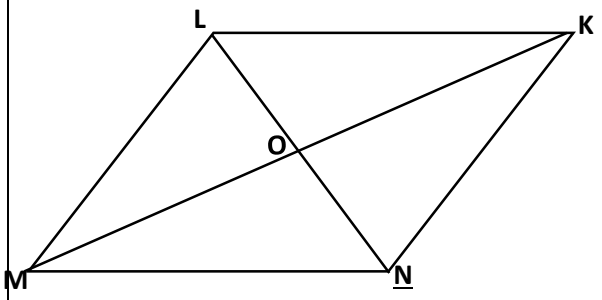
5. Shade $(A \cup B)'$ on the given Venn diagram.



6. Solve the inequality $2x + 3 \leq 5$ and write the maximum value for x

7. It takes 4 men to complete a certain task. Find the number of men required to complete that task within 6 days.

8. Using the given parallelogram $KLMN$,put $\surd$ mark infront of the correct statement.



i. $MO = KO$ and $\frac{LN}{2} = ON$ ☐

ii. $M\hat{L}O = K\hat{L}O$ and $L\hat{K}O = O\hat{M}N$ ☐

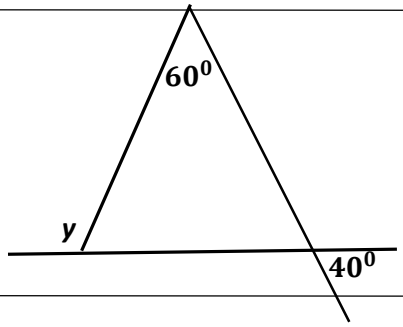
iii. $LN = MK \; and \; KL = MN$ ☐

iv. $L\hat{K}N = L\hat{M}N$ and $M\hat{L}K = K\hat{N}M$ ☐

9. Write $x^2 - 7x + 10$ as a product of two factors.

10. Find the total amount that a man has to pay to settle a loan in one year, if he borrowed Rs.15000/= at an annual simple interest rate 12%.

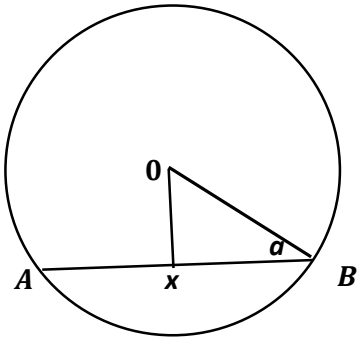
11. Find the value of angle $\boldsymbol{y}$ using the given data in the figure.



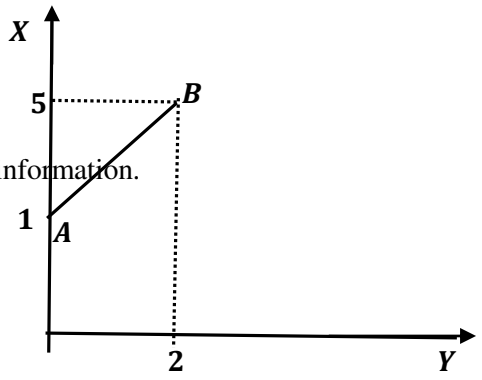
12. An unbiased coin and an unbiased dice with numbers marked on its faces from 1 to 6 are tossed together. Find the probability of getting head of the coin and 3 of the dice.

13. Find the Least Common Multiple of $6p^2$, $4pq$, 3

14. The midpoint of the chord AB of the circle with the center o is x .If $X\hat{O}B = 60^0$,find the value of the angle $\boldsymbol{a}$.



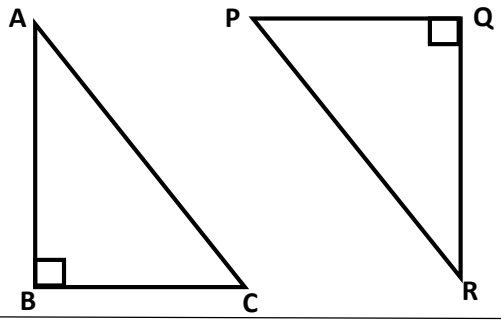
15. Find the gradient of the straight line AB using the given information.



16. Find the volume of the cylinder with base area $50\ cm^2$ and height $15\ cm$.

17. There are 45 students in a class and 9 were absent on Monday. To represent the students who were present on that day in a pie chart, find the magnitude of the angle at the sector.

18. Place the √ mark infront of the correct statements from the following triangles.



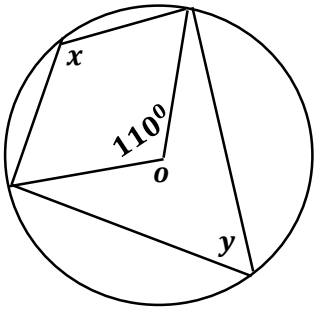
i. $If\ AC = PR$ and $BC = PQ$ two triangles are congruent under RHS case. ☐

ii. $If\ AB = QR$, and $BC = PQ$ two triangles are congruent under SAS case. ☐

iii. $If\ A\hat{C}B = R\hat{P}Q$ and $BC = QR$ two triangles are congruent under AAS case. ☐

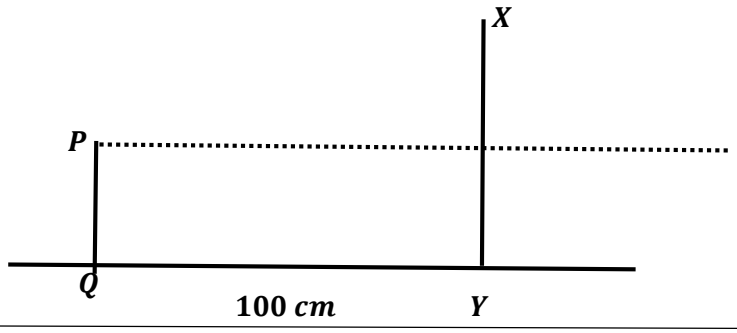
19. Solve $\frac{x+2}{3} = 5$.

20. The figure shows a circle with centre O. Find the value of the angles x and y .

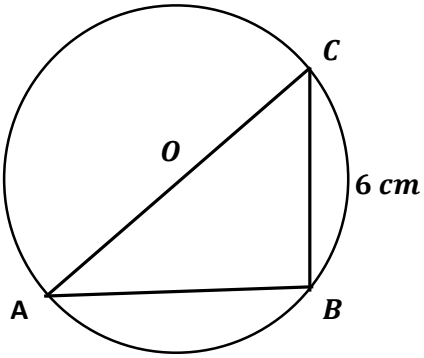


21. Simplify $\frac{1}{3x} + \frac{5}{6x}$

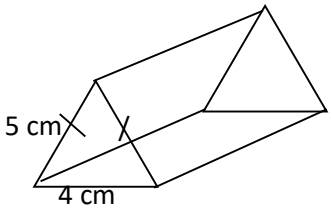
22. Two pillars PQ and XY are on a horizontal ground with distance 100m are shown in the figure. The angle at elevation from P to X is 50^0 .The angle of depression from P to X is 44^0. Mark the given data on the figure.



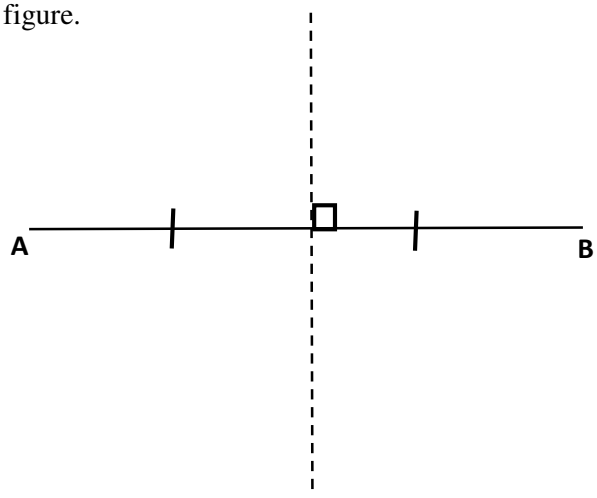
23. Find the length of the side AB in the circle with centre O and radius 5 cm.



24. Draw two sketches with different faces of the given prism with triangular cross section with measurements.



25. A and B are the shrine room and the library of the school. Two flower plants should be planted with the equidistance from the shrine room and the library and 7m away from the straight line joining the shrine room and the library. Using the knowledge of loci, mark where the two plants should be planted on the given figure.



Part B

Answer all the questions on the paper itself.

---

1) The amount of milk received in a day for a milk product factory was used to produce different milk products as following.

- $\frac{3}{7}$ of total amount was used to produce yoghurt products.
- $\frac{5}{8}$ of rest was used to produce milk toffee.
- After that, the rest 24 litres was used to sell as liquid milk.

i. What is the fraction of rest amount of milk of total amount, after using yoghurt product?

(01 mark)

ii. What is the fraction used for producing milk toffee from total amount of milk?

(02 marks)

iii. What is the fraction used for selling liquid milk from total amount of milk?

(02 marks)

iv. How many litres of milk was the factory received on that day?

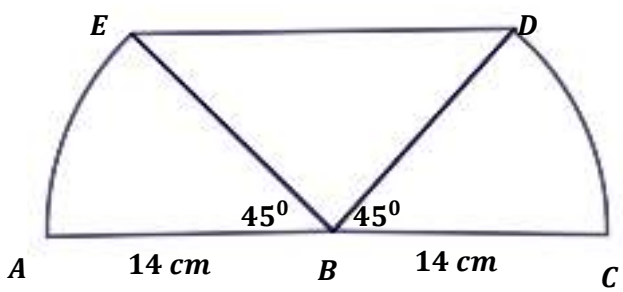
(02 marks)

v. If it is possible to make 50 milk toffees by one litre of milk, find the number of milk toffee produced on that day?

(03 marks)

---

2) A wooden plate prepared for hanging keys is shown below. It consists of two sectors ABE and BCD and right angled triangular part BDE. An iron frame is fixed around this plate.



i. Find the length of two curved edges of the wooden frame. (02 marks)

ii. If the length of DE is 20cm to the nearest centimeter, then find the length of the iron plate around the frame to the nearest centimeter. (02 marks)

iii. Find the area of the sector ABE (02 marks)

iv. Find the area of whole region of the figure. (04 marks)

---

3. (a) The annual assessed value of a certain motorcycle sales showroom is Rs.360 000/= and the relevant municipal council institution charges 8% of the value as rates annually.

i. How much has to be paid as rates for a year? (02 marks)

ii. How much has to be paid as rates for a quarter? (02 marks)

(b) Imported value of a motorcycle to this showroom is Rs.450 000 and the custom duty is 40%.

i. How much has to be paid as custom duty? (02 marks)

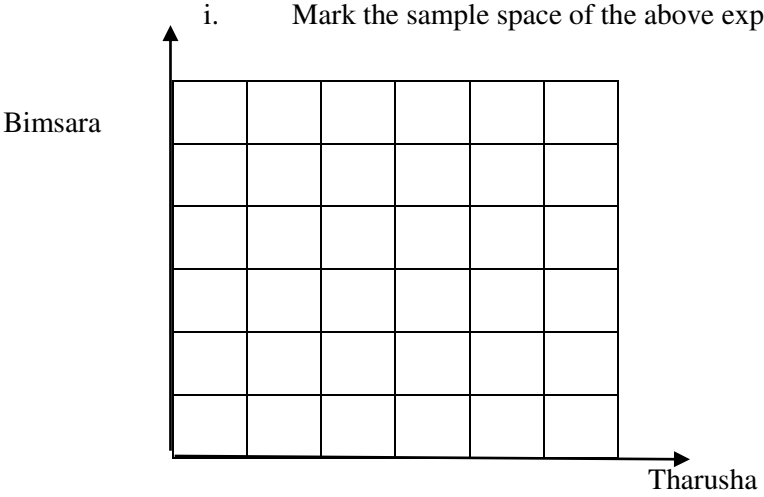
ii. Rs.70 000 was spent for landing and other expenditure. Find the value of the motorcycle after paying landing and other expenditure? (01 mark)

iii. To obtain Rs. 10 000/= as profit, the price is marked for a motorcycle. If 12% should be paid as VAT, find the selling price of the motorcycle. (03 marks)

---

4. (a) Tharusha has 3 mango seeds and 2 jack seeds. Bimsara has 4 mango seeds and one jack seed. These two persons wish to plant one of a seed randomly by selecting that they have. Consider mango seeds as M_1, M_2, M_3 ... ... and the jack seeds as J_1, J_2 ... ...

i. Mark the sample space of the above experiment on the grid. (03 marks)

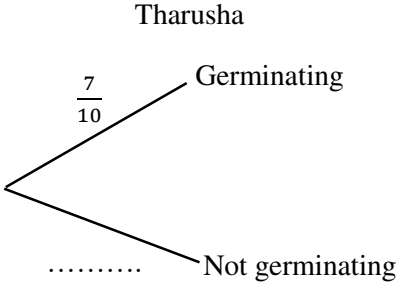


ii. Mark the event that selecting a jack seed by only one person and find the probability of that. (02 marks)

b) Later they have divided all seeds. Tharusha got all 7 mango seeds and Bimsara got all three jack seeds. Then they have selected seeds that they have to plant randomly.

The germination of a mango seed is $\frac{7}{10}$ and germination of jack seed is $\frac{9}{10}$.

i. Complete the tree diagram to show the seed taken by Tharusha either germination or not. (01 mark)



ii. In the second time, Bimsara selects a seed randomly. Expand the tree diagram to show the event by showing relevant probabilities as germinating or not.

(02 marks)

iii. Find the probability of two seeds getting germinated.

(02 marks)

5. The uncompleted frequency distribution shows the amount of kilograms of tomatoes sold by a seller within a month to find out the mean.

Tomatoes (Kg)	Mid value x	Number of days f	$f \times x$
0 - 6		1	
6 – 12		4	
12 – 18		4	
18 – 24		6	
24 – 30		8	
30 – 36		4	
36 – 42		3	
		$\sum f = 30$	$\sum f x =$.....

i. Find the modal class of the distribution. (01 marks)

ii. Write the number of days that tomatoes were sold more than 24Kg, as a percentage, out of total number of days. (02 marks)

iii. Complete the table. (03 marks)

iv. Find the mean number of kilograms of tomatoes sold in a day. (02 marks)

v. If one kilogram of tomatoes was sold at Rs.120, find the income by selling tomatoes in this month.

(02 marks)

පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව - උතුරු මැද පළාත
மாகாணக் கல்வித் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION – NORTH CENTRAL PROVINCE

Third Term Test - 2023

Grade
10

Subject :- Mathematics - II

School Name : .....

Index Number : .....

Time : **03** hrs. **10** minutes

10 minutes for extra reading.

- Answer 10 questions by selecting 5 questions from part A and 5 questions from part.
- Write correct steps and correct units when answering the questions.
- The volume of a right circular cylinder of radius ***r*** and height ***h*** is $\pi r^2 h$ $\left(\pi = \frac{22}{7}\right)$

Part A

Write the answers for only 5 questions.

1) A man gets Rs.75 000 monthly salary from his job. He gets Rs.40000 monthly from his property. According to his annual income, he has to pay the income tax as in the following table. The rest of money after paying tax, he deposits in a bank according to the annual simple interest 12%. Show that the interest he gets at the end of the year is Rs.166 176.

Income	Tax percentage
Initial Rs.500 000	Tax free
Next Rs.500 000	**4%**
Next Rs.500 000	**8%**

(10 marks)

2) An uncompleted value table is given below to draw the function $y = -x^2 + 7$

x	-3	-2	-1	0	1	2	3
y	-2	3	6	7	6	.....	-2

i. Find the value of y when $x = 2$ (01 mark)

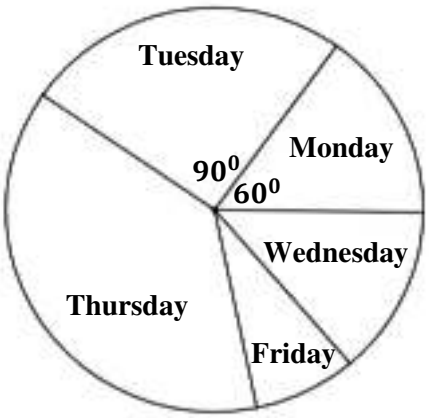
ii. Sketch the graph of the function taking 10 small units as one unit along the ***x*** axis and 10 small units as one unit along the ***y*** axis. (03 marks)

iii. Write the equation of the symmetrical axis and the coordinates of the turning point. (02 marks)

iv. Find the range of ***x*** of the function increasing positively. (02 marks)

v. Find the roots of $-x^2 + 7 = 0$ using the graph. (02 marks)

3) The pie chart shows the guava harvest got by a farmer within 5 days in a week. 20 Kg of Guava were harvested on Monday.



i. How many kilograms were harvested within these five days? (02 marks)

ii. If 15kg were harvested on Wednesday, find the angle at the sector on that day. (01 mark)

iii. How many kilograms of guava harvested on Tuesday? (02 marks)

iv. The ratio of the harvest on Thursday to Friday is 9:2, find the harvest within those two days separately. (03 marks)

v. If Rs.2000 was received on Tuesday more than that of on Monday, find the total income he got by selling guava within these five days. (02 marks)

(Assume that all the harvested guava were sold.)

4) (i) Rs.3 500 is with Suleiman and Rashmika. To buy Rs.10 000 worth mobile phone, they need twice of money that Suleiman has and thrice of money that Rashmika has and Rs.1 000 more. Take the amount of money Suleiman has $\boldsymbol{a}$ and Rashmika has $\boldsymbol{b}$, build up two simultaneous equations and find the amount they have separately by solving them. (07 marks)

(ii) If they can buy 6 books each Rs.$\boldsymbol{x}$ and two mathematical instrument boxes each Rs.700 for the amount they have, build up a simple equation and find the price of a book by solving it. (03 marks)

5) i. Expand and simplify $(x-3)^2$ (02 marks)

ii. Simplify $\frac{5}{(x+5)^2} - \frac{1}{x^2+7x+10}$ (04 marks)

iii. Solve $x^2 - 5x - 24 = 0$ (04 marks)

6) Two vertical buildings PQ and XY are situated next to each other on a horizontal plane ground. The bottom X, of the building XY can be seen from P of the building PQ at an angle of depression 50^0 and the top Y of the building XY can be seen at an angle of elevation 20^0 .Consider that the height of the building PQ is 10m.

i. Draw a suitable sketch and mark the given information. (03 marks)

ii. Draw a scale diagram if $1\ cm$ represents $2m$ (03 marks)

iii. Find the actual distance between two buildings using the scale diagram. (02 marks)

iv. Find the actual height of the building XY using the scale diagram. (02 marks)

Part B

Answer five questions only.

7) Tiles are laid in a geometric progression from the top row to the bottom row of a roof. The n^{th} term of the geometric progression is $T_n = 3n - 2$

i. Find the number of tiles in the top three rows separately. (03 marks)

ii. If there are 58 tiles at the bottom row, find the total number of rows in the roof. (02 marks)

iii. Find the total nuber of tiles on the roof. (03 marks)

iv. If one tile is Rs.520, find the total amount needed to lay tiles of that roof. (02 marks)

8) Use only the straight edge with cm/mm scale and the pair of compasses for the following construction.

i. Construct the triangle A$\hat{B}$C, $AB = 7\ cm$, $ABC = 60^0$ and $BC = 5\ cm$ (03 marks)

ii. Construct a parallel straight line to the side AB via C (02 marks)

iii. Construct a perpendicular from B to that parallel line and name the base of that as O. (03 marks)

iv. Construct a circle with radius OB and centre O. (02 marks)

9) In the parallelogram ABCD, the point M is situated on BC as BM = DN and N is situated on the side AD

i. Mark the data on a suitable sketch. (03 marks)

ii. Prove ABM $\Delta \equiv$ CDN Δ. (04 marks)

iii. Prove AMCN quadrilateral as a parallelogram. (03 marks)

10)

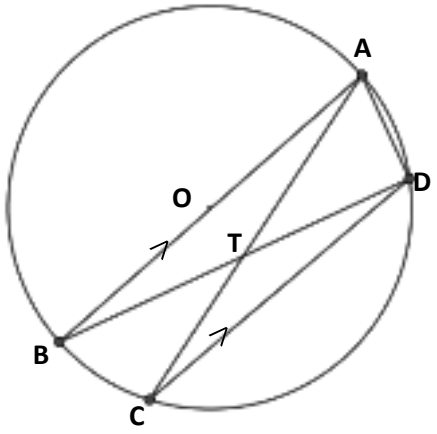
AB and CD are parallel chords of the circle with Centre O.

Show that A$\hat{T}$D = 2 A$\hat{B}$D

Show that T$\hat{A}$D =$90^0 - 2$ A$\hat{B}$D

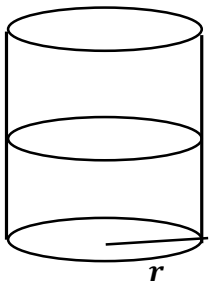
(Hint: Take A$\hat{B}$D = x)

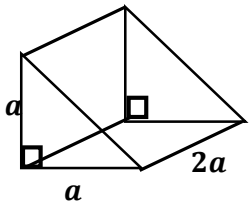
(10 marks)



11) When a solid prism as in the diagram is immersed in a cylindrical vessel of radius r unit, the water level of the cylinder increased by $\boldsymbol{a}$ units. Show that $r = \frac{a}{\sqrt{\pi}}$.

If $a = 5.8$ and $\sqrt{\pi} = 1.77$, find the radius of the cylindrical vessel to the nearest whole number by using the logarithm tables.

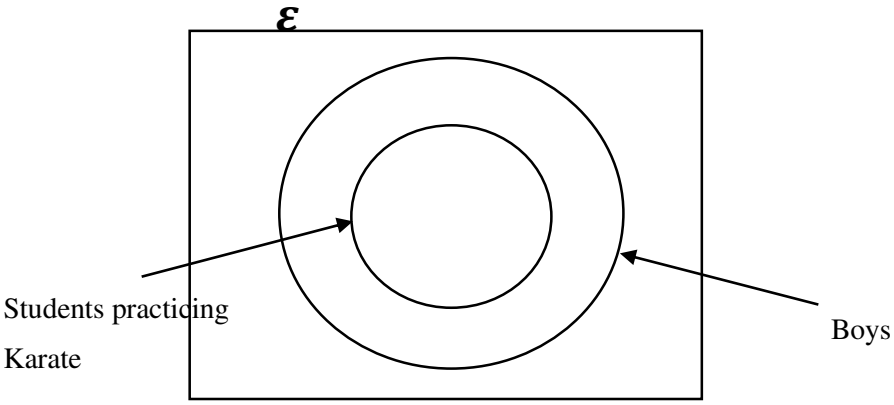




(10 marks)

---

12. There are 125 students in grade 10 at a certain school.65 are girls of them. All 34 Students practicing Karate are boys.



i. Copy the Venn diagram given above in your answer sheet and complete the given information. (03 marks)

ii. How many boys do not practice Karate? (01 marks)

iii. 15 girls participated in Karate practices later. Consider the changed data and draw a suitable Venn diagram to enter the relevant information and complete it. (03 marks)

iv. Shade the region of the boys who do not practice Karate in the diagram drawn later. (01 marks)

v. What is the total number of students who do not practice Karate? (02 marks)