Third Term Test - 2023
MATHEMATICS - I

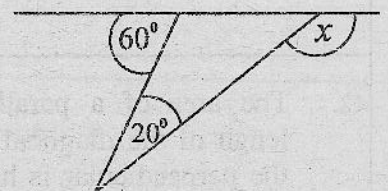**Grade 10**　　　　ගණිතය - I　　　　Time : 2 hours

Name / Index No.

* This question paper has two parts A and B. Answer all questions in A and B. Question No. 01 - 25 of Section A will carry 50 marks of 2 marks each.

Section A

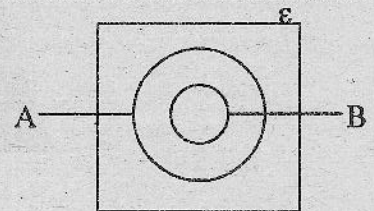|	
01.	The first approximation of $\sqrt{21}$ is, (i) 4.4　　(ii) 4.5　　　(iii) 4.6　　　(iv) 4.7
02.	Simplify. $\dfrac{2}{x} - \dfrac{1}{3x}$
03.	Find the value of x from the information given in the figure.
04.	Express in logarithmic form. $2^6 = 64$
05.	How many men should be employed to complete a work in 4 days which was proposed to be completed by 8 men in 5 days?
06.	Shade the area $A \cap B'$
07.	Factorise the expression $8x^2 + 4x - 6x - 3$.
08.	Find the perimeter of the sector shown here.

14 cm
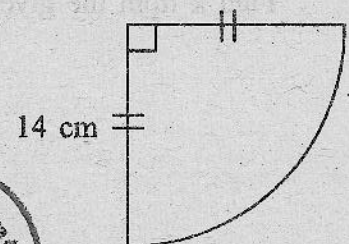
09.	Find the least common multiple of $4a^2b$, $6ab^2$, $9ab$.

10.	O is the center of the given circle. Find x.
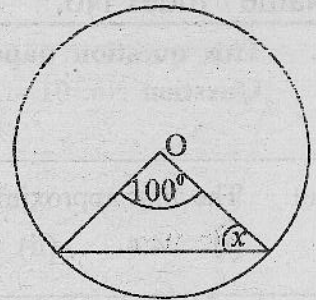
11.	Solve $(x - 3)(x + 2) = 0$

12.	The area of a parallelogram is 120 cm². The lengh of the diagonal is 20cm and the length of the perpendicular is h cm. Find the value of h.
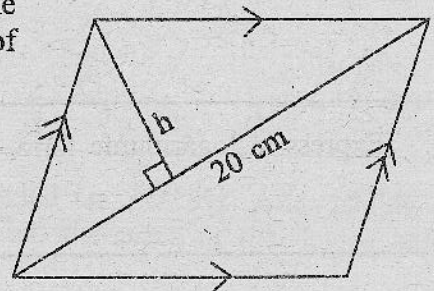
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13.	The triangles ABC and PQR shown in the figure are congruent. Write the case of congruency and write the length of side AC.
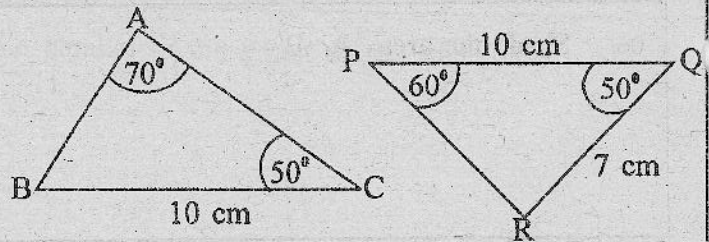
14.	The center of the circle shown in the figure is O. Find x from the given information.
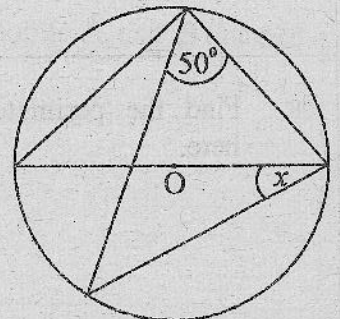
15. The last 6 data of a numerical distribution with 11 data are 14, 17, 17, 23, 25, 28 . Find the median.

16. The figure shows a parallelogram. Find the value of a- b from the given information.

$b+18^0$

$a - 12^0$
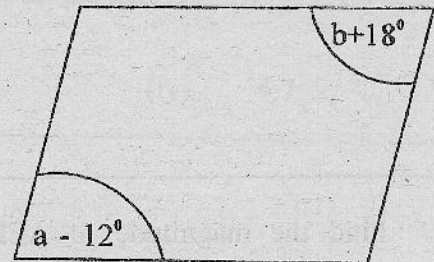
17. Find P (A∩B) when A and B are 2 independent events. P (A) $= \dfrac{3}{7}$ P (B) $= \dfrac{2}{3}$

18. The area of the shaded area of the triangular prism shown in the figure is 25cm². Calculate its volume.

12 cm
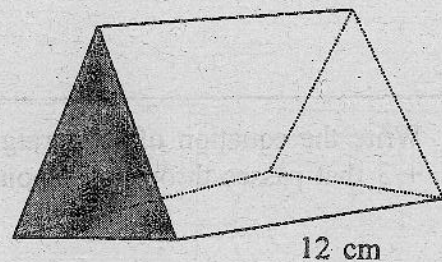
19. A tank is filled with water at the rate of 50 liters per minute from a water supply pipe. If the capacity of the tank is 2500 l find the time taken to fill the tank completely.

20.	If $x - y = 15$ find the value of $x+y=7$ $(x-y)$, without solving the pair of simultaneous equations.

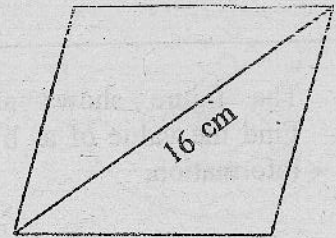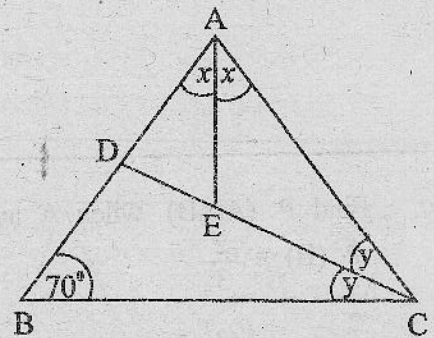|		
21.	The perimeter of the rhombus shown in the figure is 40 m. If the length of one diagonal is 16 cm, find the length of the other diagonal.	16 cm

22. Find the magnitude of $A\hat{E}D$ from the information shown in the figure.

23. An electrical appliance is charged on a value added tax of 18%. After paying the tax, the price of the device is Rs. 47 200/=. Find the price of the device before paying the tax.

24. Write the equation of the straight line parallel to the graph of the function $y = -2x + 3$ that passes through the point $(1, -1)$.

25. X and Y are 10 meters apart. Sketch the positions of two points A and B located equidistant from X and Y and at a distance of 3 m from XY.

● Answer all the questions. 10 marks per question.

01. A government employee spends $\frac{2}{5}$ of his salary for food, $\frac{1}{3}$ for paying bills and $\frac{3}{4}$ of the remainder for children's education. Then 15 000/= remained.

(i) Write the fraction of his salary that he spends on food and bills.

(ii) What fraction of the salary does he spend on children's education?

(iii) What fraction of the salary is the amount remaining in his hand at the end?

(iv) Find his monthly salary.

(v) How much does he spend per month on food?

02. A schematic diagram of a swimming pool constructed in a tourist resort is shown in Fig. It has a rectangular section and a section in the shape of a sector . The sector part is reserved for children and the rest for adults.

(i) Find the radius of the sector .
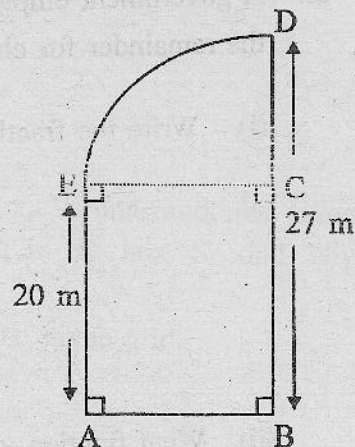
(ii) Find the perimeter of the section reserved for children..

(iii) Find the area of the bottom of the swimming pool.

(iv) What is the total cost to construct a safety fence around the swimming pool at a cost of Rs.1 200/= per meter.

03. (a) The uniform speed of a train is 90kmh⁻¹

    (i) Find the speed in meters per second.

    (ii) If this train takes 7 seconds to cross a platform 100 m long, find the length of the train.

(b) 40 students in a hostel have enough food for 12 days.

    (i) How many days is that amount of food enough for one student?

    (ii) If 10 more students join the hostel after 2 days, For how many days will the remaining amount of food be enough?

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04. Below is an incomplete table showing how the students of grade 10 have chosen the subject of aesthetics.

Subject	Number of student	Angle of the sector
Art	60⁰	90⁰
Dancing	50⁰	....
Music	....	105⁰
Drama and theater	40⁰	....
English literature	....	....

(i) Fill in the blanks in the table.

(ii) Represent the above information in a pie chart.

(iii) If 8 of the music students are transferred to drama and theater , then find the angle of the sector for drama and theater .

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05. (a) There are 5 identical cards numbered 1 to 5 in a box. Varuna randomly takes a card from it and looks at its number and puts it back in the box. Second, Niyas also draws a card at random from the box.

(i) Plot the sample space for the above scenario on the given grid.

Niyas

```
5 ┤ ┼ ┼ ┼ ┼
4 ┤ ┼ ┼ ┼ ┼
3 ┤ ┼ ┼ ┼ ┼
2 ┤ ┼ ┼ ┼ ┼
1 ┤ ┼ ┼ ┼ ┼
  └─┴─┴─┴─┴──→
  1  2  3  4  5    Varuna
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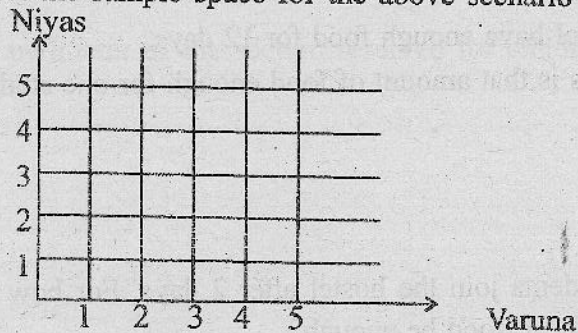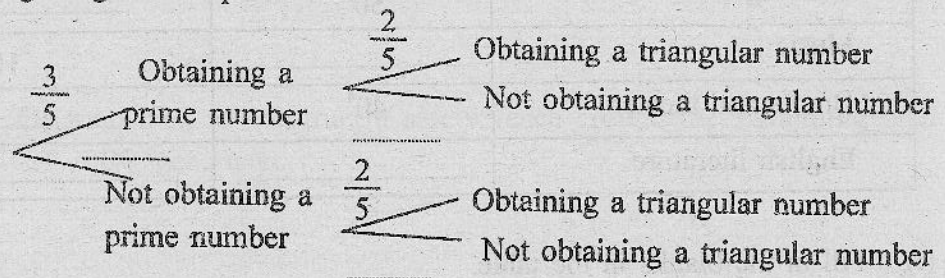
(ii) Find the probability of both getting the same number by encircling the grid.

(iii) Find the probability that both get prime numbers.

(b) In the above test, Varuna expected a prime number and Niyas expected a triangular number. The incomplete tree diagram shows the probabilities of getting and not getting their expectations.

$\dfrac{3}{5}$ Obtaining a prime number

$\dfrac{2}{5}$ Obtaining a triangular number

Not obtaining a triangular number

.... Not obtaining a prime number

$\dfrac{2}{5}$ Obtaining a triangular number

Not obtaining a triangular number

(i) Complete the diagram.
(ii) Find the probability that both expectations are fulfilled.

Received your mail.Good job!Ok, I will do it.

Third Term Test - 2023
MATHEMATICS - II

Grade 10   ගණිතය - II   Time : 3 hours

| Name / Index No. | 2024-03-05 |

* Answer 10 questions from section A and five questions from section B. 10 marks per question.
* The volume of a cylinder of radius r and height h is $\pi r^2 h$

Section A

* Answer only five questions.

01. A person deposits an amount of Rs.250 000 in a financial institution for a period of 3 years at a nominal interest rate of 14% per annum. After 3 years the total amount is received and he is going to import a motorcycle worth 250,000/=. There is a 20% stamp duty and 18% value added tax on all expenses. Find the amount left with him after all expenses for the motorcycle.

02. Below is an incomplete table prepared to draw the graph of $y = x^2 - 5$.

x	-3	-2	-1	0	1	2	3
y	4	-1	....	-5	-4	-1	4

   (i) Find the value of y when x = 1.

   (ii) Draw the graph of the above function scaled so that a unit is represented by 10 small squares along the x-axis and y-axis.

   (iii) Write the range of values of x over which the function is negatively increasing.

   (iv) Find the root of x - 5 = 0 using the graph.

   (v) Write down the coordinates of the vertex of the function $y = 5 - x^2$.

03. The following table shows the amount of kilograms of tea leaves brought to a tea collection center in 30 days.

Tea leaves (kg)	101 - 109	110 - 118	119 - 127	128 - 136	137 - 145	146 - 154	155 - 163
No. of days	1	4	5	8	6	4	2

   (i) Write down the mode class.

   (ii) Find the mean of the number of kilograms of tea leaves brought in a day to the nearest whole number by taking the mean of the mode class as the assumed mean or by some other method.

   (iii) Find the number of kg of tea leaves that can expected to be carried in the next 3 months based on the above mean.

04. (a) Solve

$$\frac{1}{x-3} - \frac{2}{3(x-3)} = \frac{1}{6}$$

(b) The price of an orange is 50 rupees more than the price of of an apple. It costs 1400 rupees to buy 03 oranges and 02 apples.

(i) Taking the price of an orange as Rs.x and the price of an apple as Rs.y, construct pairs of equations containing x and y.

(ii) Find the difference between the price of an orange and the price of an apple by solving them.

05. The lengths of the sides containing the right angle of a right triangl are x and (x+7) respectively. Its hypotenuse is (2x + 3) Relate the lengths of the sides and show that x gives an equation of $x^2 - x - 20 = 0$. Calculate the area of the triangle by solving it.

06. A flagpole is mounted on the top of a vertical building. An observer 50 m away at the base of the building can see the bottom and the top of the flagpole at the angles of elevation of 40° and 45° respectively.

(i) Take the scale as 1m to show 10 m and draw a scale diagram \

(ii) Write the above scale as a ratio.

(iii) Calculate the actual height of the flag pole from the above diagram .

Section B

07. For a drill show, children are lined up such that 5 children are in the first row, 8 children are in the second row, 11 children are in the third row, etc.

(i) Which type of a progression is this? Give reasons for your answer.

(ii) How many students are there in 8th row ?

(iii) In which row are 32 children lined up?

(iv) What is the total number of students in the drill team if there are 38 children in the last row?

08. Do following constructions by marking the lines   clearly using only a compasses and a straight edge with cm / mm scale.

(i) Construct a triangle ABC such that AB = 7 cm, BC = 5cm and $A\hat{B}C = 60°$.

(ii) Construct a parallel line through C which is parallel to AB.

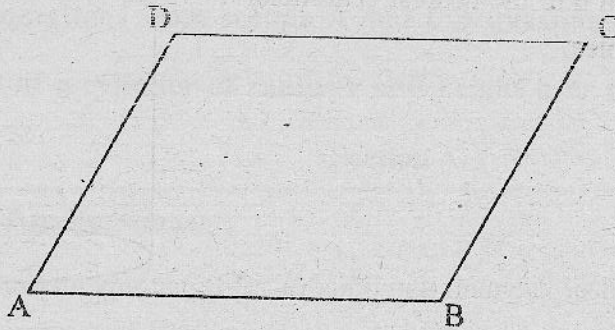(iii) Construct the locus of the points equidistant from AB and AC.

(iv) Name the point D where the parallel line meets the locus in (ii) above.

(v) Show that $C\hat{A}D = C\hat{D}A$.

09. ABCD is a parallelogram. M and N lie on the bases AB and CD such that BM = DM.

   (i) Show that AMD and CNB are congruent
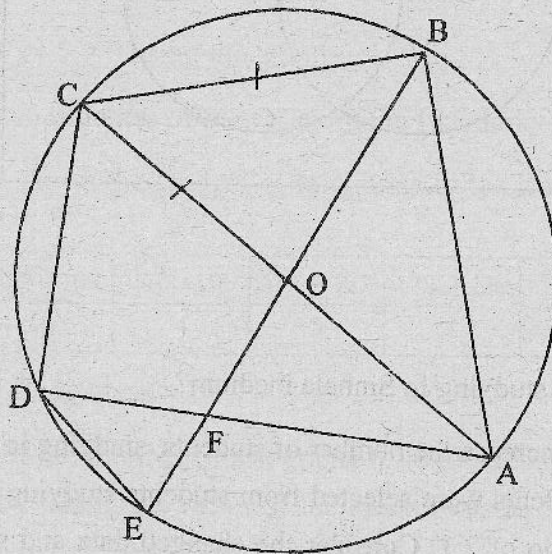
   (ii) Show that ANCM is a parallelogram.

10. AC and BE are two diameters of a circle with center O. D is a point on the circumference. Here OC = CB .

   (i) Show that OBC is an isosceles triangle.
   Find the following angles with reasons.

   (ii) $A\hat{D}C$

   (iii) $A\hat{B}E$

   (iv) Find the value of $O\hat{C}D + O\hat{F}D$.

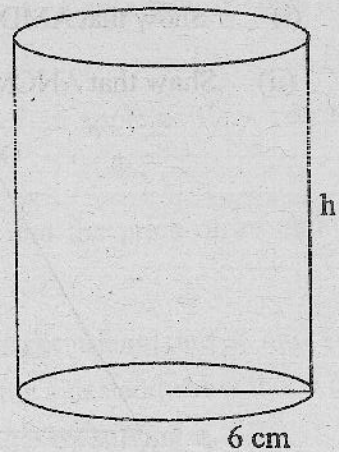11. The radius of the cylinder shown in the figure is 6 cm and its volume is 1201.2 cm³.
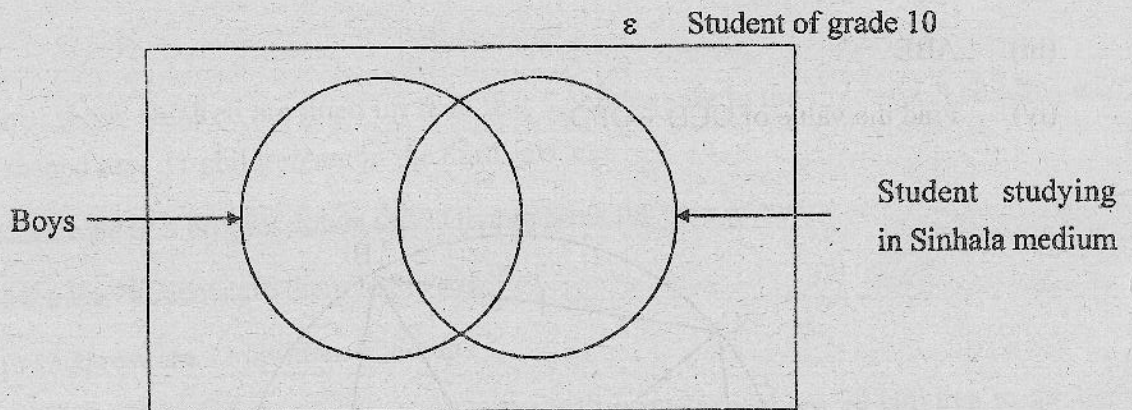
show that,

$$h = \frac{100.1}{3\pi}$$

Take $\pi = 3.14$ and find h to the nearest centimeter using logarithmic tables.

6 cm

12. 80% of 240 grade 10 students are studying in Sinhala medium. The total number of girls in grade 10 is 100 and one of them is studying in English medium.

(i) Complete the Venn diagram below.

ε   Student of grade 10

Boys

Student studying in Sinhala medium

(ii) How many boys are studying in Sinhala medium?

(iii) It was proposed to increase the number of students studying in English medium to 25%. For that, more students were selected from students studying in Sinhala medium in the male to female ratio of 2:1. Consider the changed data and show the information in a suitable Venn diagram.