සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
சபரகமுவ மாகாண கல்வித் திணைக்களம்
Sabaragamuwa Provincial Department of Education

දෙවන වාර පරීක්ෂණය - 2018 ජූලි	10 ශ්‍රේණිය
இரண்டாம் தவணைப் பரீட்சை 2018	தரம் - 10
Second Term Test – 2018 July	Grade - 10

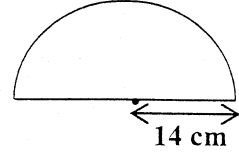|			
ගණිතය	I	පැය දෙකයි	
கணிதம்	I	2 மணித்தியாலம	
Mathematics	I	2 Hours	

Part - A

■ **Answer all the questions on this paper it self.**

01. Between which two whole numbers that $\sqrt{56}$ les?

02. If the radius of the given semi circular lamina is 14 cm, find the perimeter of it.

03. In triangles ABC and PQR, AB = PQ, $A\hat{B}C = P\hat{Q}R$. Name another pair of equal elements for the two triangles to be congruent. Name the relevant case of congruence also.
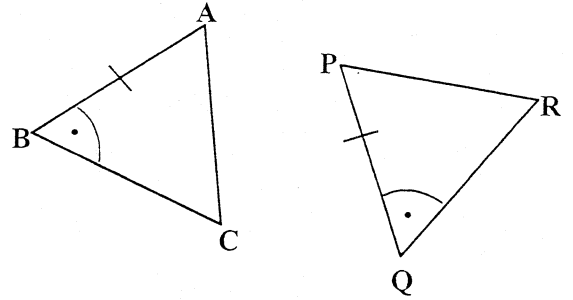
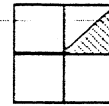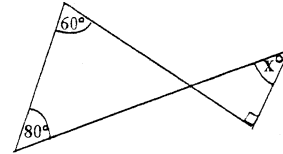04. The angle of the center of the following sector is 45 ° and its radius is 7 cm. Find the area of it.
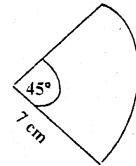
05. Find the least common multiple (L.C.M.) of $6a^2$, $4a^2b^2$

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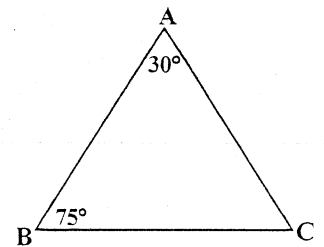**06.** Find the area of the shaded part as a fraction of the whole figure.

07. Find the value of x according to the information given on the diagram.

08. Factor $x^2 + 6x + 5$

09. Name a pair of equal angles according to the information given On the diagram.
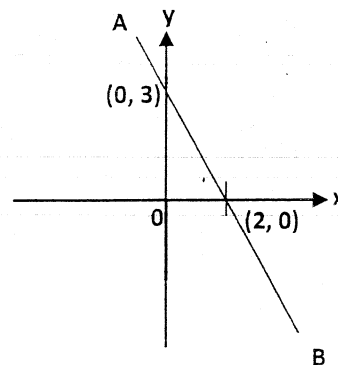
10. Write the equation in the logarithm form $a^x = y$

11. Simplify. $\dfrac{6}{5x} - \dfrac{1}{x}$

12. According to the information given on the diagram , find

(i) The intercept

(ii) The gradient

Of the straight line AB

13. The area of the bottom of a water tank is 4 m^2. It takes ½ an hour to fill water in to the tank up to 2 m height by a tube. Find the rate of water flowing to the tank in "cubic meters per hour".

14. 8 men spend 9 days to excavate a drain. If the task is to be done in 6 days how many men should be employed?

15. ABCD is a parallelogram

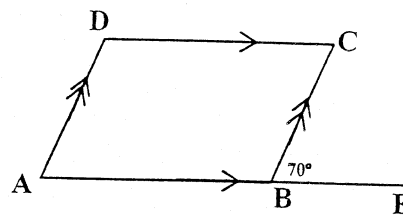 $A\hat{B}D = 35°$, $A\hat{D}C = 80°$, Find the value of $D\hat{B}C$
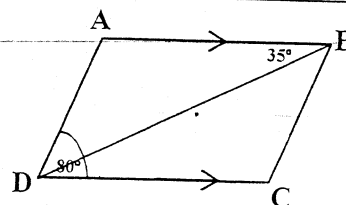
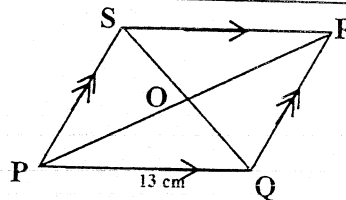16. Find the value of the angle $A\hat{C}B$ according to the information given on the diagram.
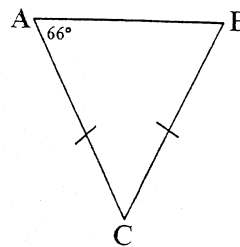
17. ABCD is parallelogram. $C\hat{B}E = 70°$, Find the value of $A\hat{D}C$

18. $\dfrac{3}{2a} + \dfrac{5}{a} = \dfrac{1}{2}$ Solve.

19. PQRS parallelogram PR = 24 cm, SQ = 10 cm, Find the perimeter of the triangle POQ.

20. Write two relationships between the sides EH and FG
    of the parallelogram EFGH
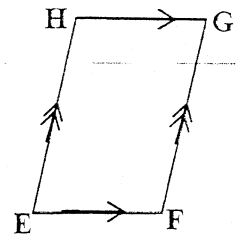
21. Information obtained from students of a class about their
    favorite game is represented in the pie chart.
    If the number of students like volleyball is 8 find the
    Number of students who like football.
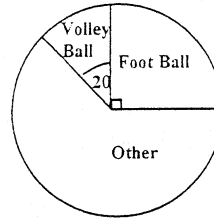
22. Solve the equation $(x - 3)(x + 2) = 0$

23. Shade the region $(A \cup B)$ on the following Venn diagram.
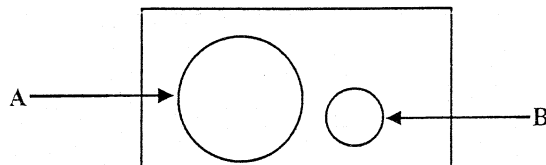
24. ABCD is rectangle. If the breadth of it is x write an
    expression for the area of the shaded semi circular part using
    π and x.

25.
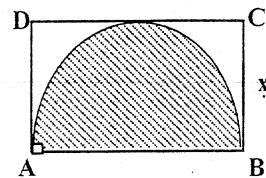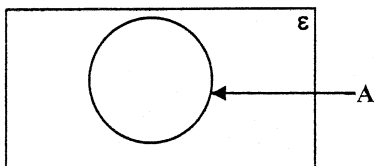
    ε = {Polygons}

    A = {Quadrilaterals}

    B = {Parallelograms}

    Represent the set B in the given Venn diagram.

01. ¼ th of the grade 10 students of Dikkumbura Maha Vidyalaya studies Information Technology. Half of the remainder studies Health Science.

(i) What is the fraction of students who study Health Science out of the total number of grade 10 student.

(ii) If the remaining number except the student of the above two subjects studies Home Science , what is the fraction of students who are studying Home Science.

1/3 of students who are studying Home Science later decided to study Agriculture, After that changing of subjects,

(iii) What is the fraction of students who are studying Agriculture?

(iv) If the number of students who study Agriculture is 30 , what is the difference between the numbers of students studying Home Science and Information Technology ?

02. The import value of a motor car is 5 000 000. When importing, a 20 % duty tax is charged for it.

(i) Find the amount of the duty charged for the car.

(ii) After importing the car the trader has to pay 15 % VAT for it. What is the amount of VAT he paid.

(iii) After paying the duty and VAT the trader marks the price of the Car expecting a profit of 50 000, what is the marked price of the car?

(iv) The customer who is buying this car will have to spend another Rs. 30 000 for the registration of it. What is the total amount that the buyer has to spend for the car.

(v) Prasnna who has deposited Rs. 5 000 000 for three years in an account of a financial institute which pays 10 % simple interest per year, intends to buy this car using the above deposit and the interest. How much more money he needs to buy the car.

03. Shown in the diagram is a trapezium shaped plot of land. Roses are cultivated in the AEB semi circular part of it and Anthuriams are cultivated in the part shaded in the Diagram.
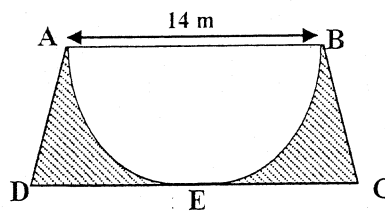
(i) Find the length of the arc of the semi circular part.

(ii) 12 iron posts are fixed along the semi circular arc AEB , with equal distances between them. There are two posts fixed at A and B also. Find the distance between a pair of consecutive posts.

**(iii)** Some decorative plants are to be grown in ABPQ rectangular plot of land attached to the AB margin of the above land. The area of the ABPQ land is equal to the area of the land AEB . Draw the sketch of the ABPQ land with relevant measurements on the given diagram.

(iv) If the area of the ABCD trapezium is 119 m^2 find the area of the part shaded in the diagram.

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04. The pie chart shown here represents the information about the hobbies of 720 students of a certain school. The angle at the center of the sector for watching T.V. is 70° and the centre angle of the sector of collecting stamps is 150° .
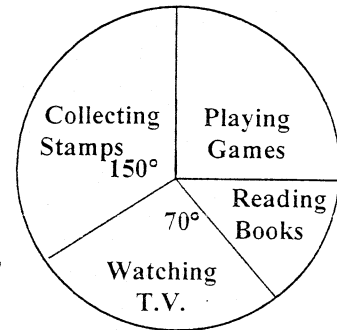
(i)   What is the number of student whose hobby is watching T.V.?

(ii) If the number of students what hobby is playing games is ¼th of the total number of students, find the number of students whose hobby is playing games and mark the center angle of the relevant sector on the diagram.

(iii) Find the centre angle of the sector which represents the students whose hobby is reading books.

(iv) Find the number of students whose hobby is reading book

(v) What is the number of students who like to watch T.V. than reading books?

05. (a) Information collected by Nimal for a research , about the number of vehicles ran on the road opposite his house in one hour time, are as follows.

- The number of vehicles ran on the road in one hour is 60.
- 28 vehicles out of the number of vehicles ran are vans and there were 25 vehicles of white colour.
- The number of white vehicle which are not vans is 15.

(i) Enter the above information in the Venn diagram given below.
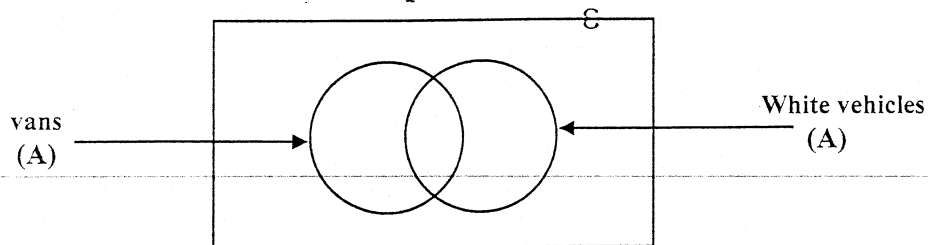
(ii) What is the number of vans which are not coloured in white ran on the road in that period of time.

(iii) Shade the region represent $(A \cup B)'$ on the Venn diagram and explain that region in words.

(b) ε = {Natural numbers from 1 to 20}

A = {Square numbers less than 20}

B = {multiples of four from 1 to 20}

Write the set $A \cap B'$ in elements.

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சபரகமுவ மாகாண கல்வித் திணைக்களம்
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இரண்டாம் தவணைப் பரீட்சை 2018	தரம் - 10
Second Term Test – 2018 July	Grade - 10

ගණිතය II	පැය දෙක හමාරයි
கணிதம் II	$2\frac{1}{2}$ மணித்தியாலம்
Mathematics II	$2\frac{1}{2}$ Hours

■ **Answer ten questions selecting five questions from part A and five questions from Part B.**

PART - A

01. (a) An incomplete table of values prepared to draw the graph of the function $y = x^2 - 4$ is given below.

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

   (i) Find the value of y when x = 0

   (ii) Using the scale of 10 small divisions representing one unit along both X – axis and Y axis. draw the graph of the above function on a graph paper.

(b) Using your graph

   (i) Find the minimum value of the function.

   (ii) Find the interval of values of x for which the function is negative.

   (iii) Find the roots of the equation $x^2 - 4 = 0$

   (iv) Write the equation of the new function obtained, when the above function is moved two units upward along the Y- axis

02. Ashen borrowed Rs.150 000 from a financial institute to pay back with 14 % annual simple interest. After two years he could pay only Rs.175 000 back. Then he borrowed another loan under the same interest rate from the same institute and after one more year closed the loan by paying Rs.142 500 .What is the amount of the second loan he took after two years?

03. Perimeter of an art work created on a wall is 190 cm . length of it is 5 cm less than the three times of the breadth. Build up a pair of simultaneous equations and by solving it find the length and breadth of the artwork . Sunil says that it costs Rs.3000 to create a part of 250 cm^2 of the artwork. Explain the correctness of the statement by calculating.

04. (i) Find the L.C.M. of $a(a+2)$, (a^2-4)

(ii) Three buses named A,B,C, are going out from a bus stand at 7.00 a.m. together.

The bus A once in every $15(a+2)$ minutes

The bus B once in every $20(a^2-4)$ minutes

The bus C once in every $(a-2)^2$ minutes

comes back to the stand and go away again. After how many minutes the three buses go out from the bus stand together at the same time. You can supply the answer in an algebraic expression.

(iii) The length and breadth of a rectangular shaped piece of cloth are 3m and 1m. Respectively this piece of cloth is separated in to small pieces such that the length side is separated in to $2x+4$ parts and the breadth side is into x^2-4 parts. Write the length and breadth of a small piece of cloth by algebraic fractions.

(iv) Write an algebraic expression for the perimeter of a small piece of cloth and simplify it.


05. (a) (i) $(2x+y)^2$ Expand.

(ii) Mr. Perera wanted to buy Y number of tea plants, Price of one tea plant is Rs. X. When he ask for it the nursery owner said if you buy 50 more plants the cost of one plant can be reduced by Rs. 1 . According to that Mr. Perera bought 50 more tea plants. Denote the total cost that Mr. Perera has to spend for buying tea plants as a product of two binomial expressions and simplify it,

(b) Factor.

(i) $3a^2+4ab+b^2$ (ii) $(2x-1)^2-6^2$

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06. (a) The shape of the badge given to wear with the uniform for the students in the sport meet of a certain school is a triangle. Shown below is a rough sketch of it. Length of the base BC is x cm and the length of the perpendicular Drawn from A to the base BC is 2 cm more than x
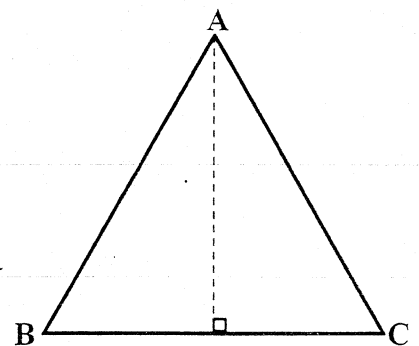
(i) Using the above information write an expression for the area of the triangle ABC.

(ii) If the area of the triangle ABC is equal to the half of area of a parallelogram in which the area is 24 cm^2 show that x is given by the quadratic equation $x^2+2x-24=0$

(iii) Find the length of the base BC and the perpendicular distance from A to BC , by solving the above quadratic equation.

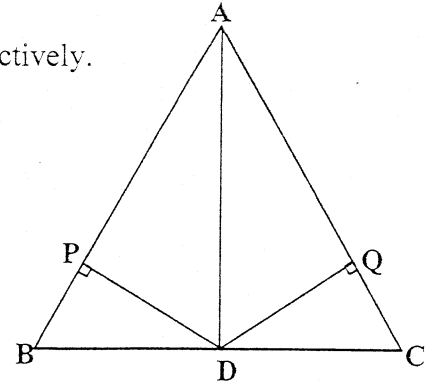(b) $U = \sqrt{V^2-2as}$ Makes as the subject of this formula.

07. In the triangle ABC , AD is the bisector of the angle BAC
Perpendiculars drawn from D to AB and AC are DP and DQ respectively.

   (i) Copy this diagram into your answer script and mark the given
Information on it.

   (ii) Prove that APD $\Delta \equiv$ AQD Δ

   (iii) If BD = DC ,prove that BDP $\Delta \equiv$ CDQ Δ

   (iv) Prove that AB = AC

08. In the triangle PQR, PQ = PR Bisector of the angle
Q$\hat{P}$R meets QR at S. Point T is on PR such that ST = TR

   (i) Copy this diagram into your answer script and mark the given information on it.

   (ii) Show that PQ and TS are parallel to each other
And prove that the triangle PTS is an isosceles triangle.
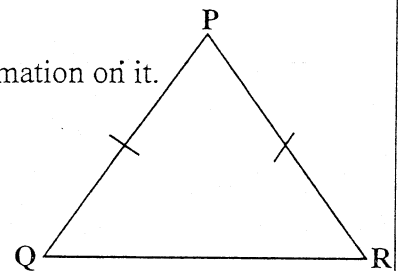
09. ABCD is a parallelogram. AE and CF are the perpendiculars drawn from A and C to the diagonal DB

   (i) Draw a rough sketch including above information.

   (ii) Show that AE//CF

   (iii) If AC and BD diagonals intersect at O, prove that ΔAOE $\equiv$ ΔCOF

   (iv) CF is produced up to G such that CF = FG prove that AEFG is a rectangle.

10. In the given diagram KL = LM and XL = XZ
If L$\hat{M}$K = x° find the value of following angles using x .You have
To give reasons for your answers

   (i) L$\hat{K}$Y

   (ii) X$\hat{L}$M

   (iii) M$\hat{Z}$Y

   (iv) K$\hat{Y}$X

   (v) If x = 35° show that the value of K$\hat{X}$Y is 40°
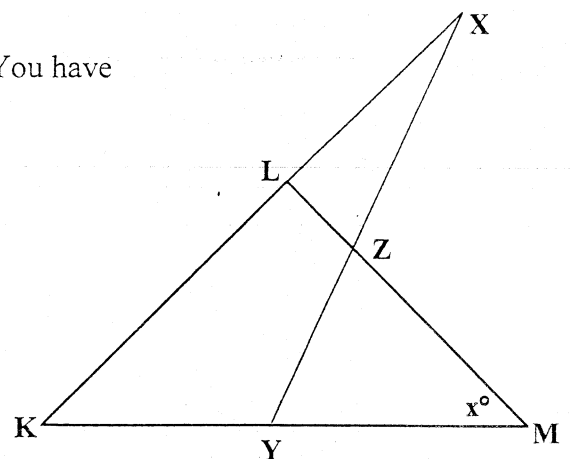
11. (a) A and B are two towns situated on a straight road with the distance between them 175 km. A lorry is travelling to the town B from A in a uniform speed of 50 kmh^{-1} After one hour of the starting time of the lorry, a jeep started to travel from town B to A with a uniform speed of 75 kmh^{-1} How far the jeep is from the town A when it passes the lorry.

(b) The area of the base of a cuboid shaped water tank is 2 m^2 When the tank is filled with 200 l of water , more water is following from a tube to the tank in the rate of 40 liters per minute . If it takes 20 minutes to fill the tank completely what is the internal height of the tank.

12. Without using logarithm tables find value of,

(i) x when log$_x$ 243 = 5

(ii) Simplify log$_3$20 + log$_3$x = log$_3$60 + log$_3$9

(iii) Find the value using logarithm tables,

$$\frac{5.432 \times 878.2}{83.8}$$

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