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சபரகமுவ மாகாண கல்வித் திணைக்களம்  
Sabaragamuwa Provincial Department of Education

පළමු වාර පරීක්ෂණය - 2018 මාර්තු  
முதலாம் தவணைப் பரீட்சை 2018 மார்ச்  
First Term Test – 2018 March

10 ශ්‍රේණිය  
தரம் - 10  
Grade - 10

ගණිතය I  
கணிதம் I  
Mathematics I

පැය දෙකයි  
2 மணித்தியாலம்  
2 Hours

Part - A

■ Answer all questions on this paper it self.

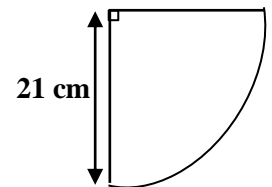
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total Marks		

01. Between which two whole numbers that  $\sqrt{46}$  lie ?

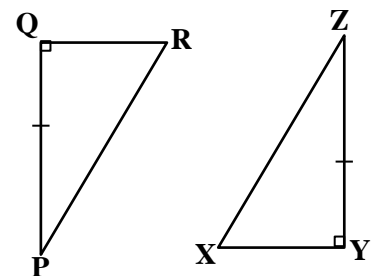
02. The number of students in a certain school is 600 and  $\frac{2}{3}$  of it are boys. What is a number of girls in the school ?

03. One factor of the trinomial expression  $a^2 + 4a - 5$  is  $(a + 5)$ . Find the other factor of it.

04. The radius of the sector given below is 21 cm. Find the perimeter of the sector.



05. According to the data marked on the diagram what is the other pair of sides or angles that should be equal to be the two triangles congruent. Mention the case of congruence also.



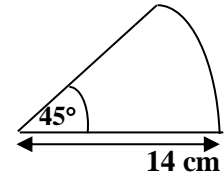
06. What is the most suitable value for the  $\sqrt{12}$  from the following answers.

(i) 3.3

(ii) 3.4

(iii) 3.5

07. Find the area of the following sector.



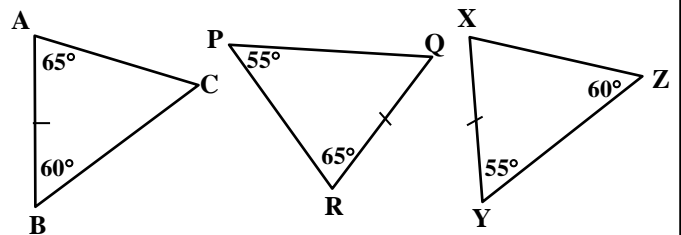
08. Fill in the blanks with suitable terms.

$$(2y + 5)^2 = (2y)^2 + 2x \dots \times 5 + 5^2$$
$$= \dots + 20y + 25$$

09. Find the L.C.M. of  $3xy$ ,  $6x^2$ ,  $12y^2$

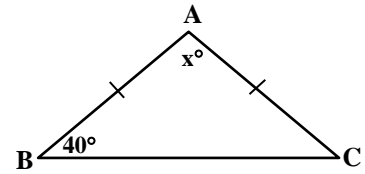
10. 12 men take 4 days to clean a land. How many days that 16 men will take to finish the same task ?

11. Select the triangle which is congruent to the triangle ABC from the following triangles. Write the side correspond to the side BC

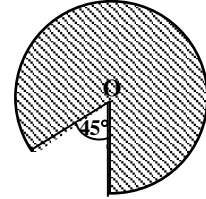


12. If  $x^2 + Ax - 24 = (x + 8)(x + B)$  find the suitable values for A and B

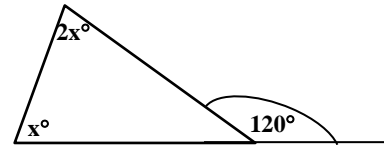
13. According to the data given on the diagram find the value of  $x^\circ$ .



14. If the area of the shaded part of the circle in which the centre is O is  $35 \text{ cm}^2$  find the area of the whole circle.



15. Find the value of  $x^\circ$  according to the data marked on it.

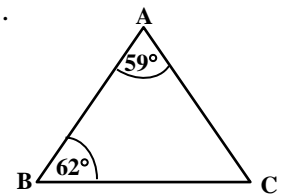


16. Fill in the blank with suitable values.

$$\begin{aligned} 98^2 &= (100 - 2)^2 \\ &= 100^2 - 2x - \dots \times 2 + 2^2 \\ &= \dots \end{aligned}$$

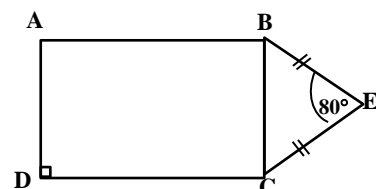
17. A task of 30 man days was done by a group of men in 5 days. If the total salary paid to all of them was Rs 36 000 . What is the salary paid for one man.

18. According to the data given on the triangle ABC, name a pair of equal sides.



19. A metal railing is fixed around a semi circular shaped pond in which the radius is 7 m, What is the length of the railing.

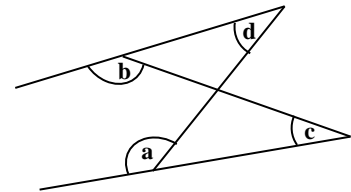
20. ABCD is a rectangle and BEC is an isosceles triangle . Find the magnitude of the angle  $\widehat{ABE}$



21. An incomplete note done by a student who tried to find the least common multiple of two algebraic terms is given below. Complete the blank of it with suitable terms.

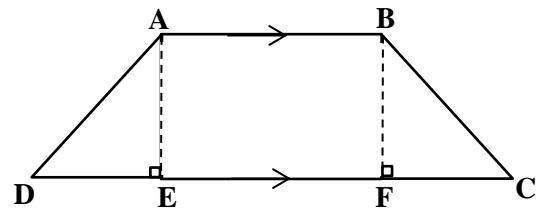
$$\begin{aligned}
 5p^2 &= 5 \times p^2 \\
 \dots\dots q &= \dots\dots \times \dots\dots \times q \\
 \text{L.C.M.} &= 30 \dots\dots
 \end{aligned}$$

22. According to the angles marked on the diagram find the value of "a" using b, c and d.

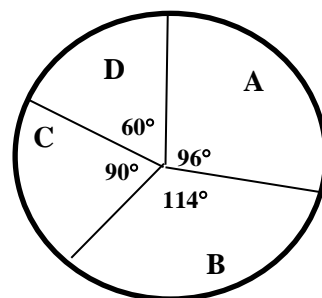


23. Hussain divided the land of 10 hectares he owns, among his four daughters and the son equally. The son cultivated cinnamon in  $\frac{3}{4}$  of the part of land he received. In how many hectares that cinnamon is cultivated ?

24. ABCD is a trapezium  $AE = DE = FC$ . Find the magnitude of the angle  $B\hat{C}F$ .



25. The following pie chart shows the information about grade 10 students of a certain school, total number of students in grade 10 is 60 and the number of students who study western music is 15. What is the letter of the sector represents the students who study western music.



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**Part – B**

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**01.** Sithum spends  $\frac{1}{8}$  of his monthly income for travelling expenses and  $\frac{2}{7}$  of the remaining amount for foods.

(i) What fraction of the total income he spend for food ?

(ii) What fraction of the total salary is spent for food and travelling ?

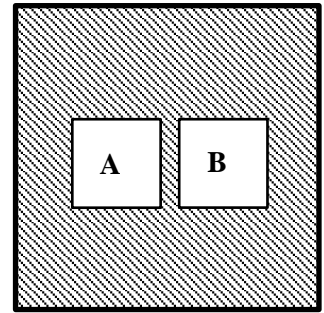
(iii) After spending for food and travelling  $\frac{1}{10}$  of the remainder is saved in an account of a bank.

If the amount saved in one month is Rs.3000 , what is the total monthly income of Sithum?

(iv) If the total expenditure for food, travelling and savings and for the education of his children is Rs 25000, what fraction of his whole salary is spent for the education of his children?

02. (a) Show that the most suitable value for the  $\sqrt{20}$  is 4.5 and it is not 4.5 .

(b) Teacher Wishwa prepared the board shown in this diagram for an activity of mathematic to be done with her students. It is prepared by removing two same size squares named A and B in the diagram, from a square shaped card board. The area of one small square  $14 \text{ cm}^2$  .



(i) Find the length of a side of the small square A ?

(ii) If the area of the shaded part of the figure is  $41 \text{ cm}^2$ , find the length of a side of the square shaped board, correct to the 1<sup>st</sup> decimal place.

(iii) A square shaped piece of an oil paper in which the area is  $100 \text{ cm}^2$  is pasted on this board, such that one vertex and two adjacent sides of the oil paper are to be coincide with one vertex and the two adjacent side of the board. Show this information by a rough sketch with relevant measurements on the given diagram.

03. Cleaning works of the “Nirogya” private hospital starts every day at 6.00 a.m. and they have to finished it at 10 a.m. In every morning 12 workers are involved with this work.

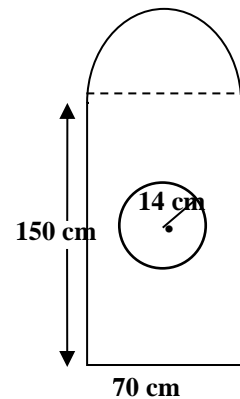
(i) What is the total number of man hours done by all workers in one day.

(ii) In a certain day 4 workers didn't come for the work. How many hours that the remaining workers will take to finish the work.

(iii) If the cleaning work is to be finished at 10.00 a.m. at which time the remaining workers should start the work.

(iv) If Rs. 200 is paid for each extra hour of work they do, what is the extra amount of money that 8 workers received on that day.

04. Shown in the diagram is a gate fixed at the entrance of a religious place. It is covered with metal plates and in the middle of the rectangular part there is a circular hole with the radius 14 cm. The hole is covered with a wire mesh.



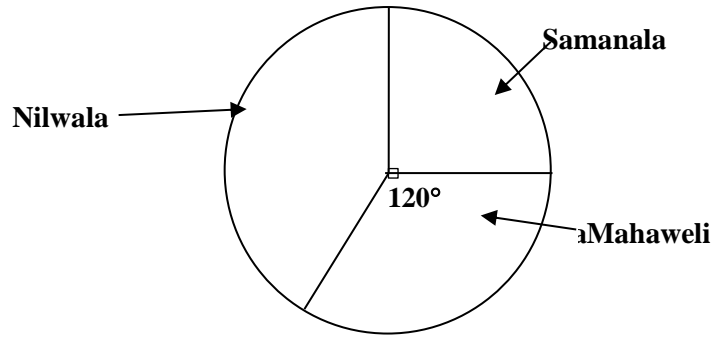
(i) Find the arc length of the semicircular part at the top of the gate.

(ii) Find the difference between the perimeters of the whole gate and the circular hole in the middle.

(iii) Find the area of the semicircular part at the top of the gate.

(iv) Find the area of metal plates used to make the gate.

05. A pie chart showing the information about the number of marks obtained by each house in the inter house sports meet of a certain school is given below.



- (i) Which is the angle of the sector that shows the number of marks of the Nilwala house.
- (ii) If the number of marks scored by the Samanala house is 336 what is the number of marks obtained by the winning house.
- (iii) If  $\frac{1}{4}$  of the marks of Mahaweli house and  $\frac{1}{3}$  of the marks of Samanala house are obtained by team events, find a relation between the number of marks of team events of the two houses.
- (iv) Because of an error happened in entering marks into mark sheets, 56 marks of Samanala house is added to the marks of Nilwala house marks. After correcting it the pie chart is to be changed. An incomplete table prepared to draw the new pie chart is given below. Complete the blanks of it with suitable values.

	<b>Samanala</b>	<b>Nilwala</b>	<b>Mahaweli</b>
Center angle	.....	.....	120°
Total Marks	.....	504	448

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පළමු වාර පරීක්ෂණය - 2018 මාර්තු  
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First Term Test – 2018 March

10 ශ්‍රේණිය  
தரம் - 10  
Grade - 10

ශ්‍රේණිය II  
கணிதம் II  
Mathematics II

පැය තුනයි  
3 மணித்தியாலம்  
3 Hours

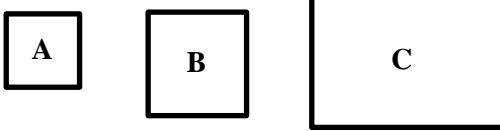
- Answer ten questions selecting five questions from part A and five questions from Part B.
- ◆ 10 marks are awarded for each question.

Part - A

01. A contractor who received a contract to build a huge building, estimated that 5 men can prepare the land for the work in 30 days.
- According to the estimate what is the total number of man days to be spent to prepare the land.
  - When 5 men worked for 10 days he took out 3 men from the work and asked remaining two men to finish it soon. How many days the two men will take to finish the work?
  - The owner of the building complains that the number of days taken to prepare the land is two times than the estimated amount. It is correct or wrong. Verify your answer by calculations.
  - Show that the difference between the amount of work done by 5 men together and the amount of work done by remaining two men is  $\frac{1}{3}$  of the total amount of the work.

02. (a) Simplify  $(2x + 3)(3x + 2)$

(b)



A, B and C are thin glass plates. A and B are square shaped and C is rectangular in shape.

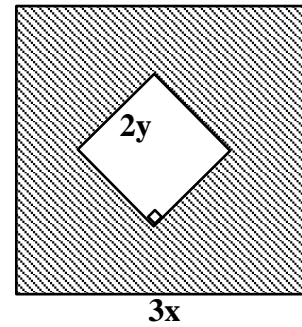
- The length of a side of B is one unit less than two times of the length of a side of A. If the length of a side of A is  $x$  units build up an algebraic expression for the area of the square B and simplify it.
- The length of the rectangle C is 9 units greater than the length of a side of A, and the breadth of C is one unit greater than the length of a side of A. Denote the area of C as a trinomial expression of  $x$ .
- Show that the sum of the areas of A and B is equal to the area of C. when the value of  $x$  is 4.

03. (i)  $2x^2 + 3x$  factor.

(ii)  $x^2 + 3x - 28$  factor.

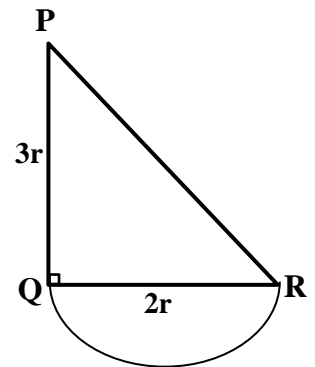
(iii) Find the value of  $35^2 - 25^2$  using the knowledge of factors.

(iv) From a square shaped metal plate with the length of a side  $3x$ , a square part with the length of a side  $2y$  is removed, as shown in the given figure. Write an algebraic expression for the area of the remaining part and factor it.



04. In the composite plane figure shown here ABC is a right angled triangle.  $PQ = 3r$  and  $QR = 2r$ . There is a semicircular part and the diameter of it is  $2r$ . Find the areas of the triangle and the semicircle

using  $r$  and if the area of the whole figure is  $A$  show that  $r = \sqrt{\frac{7A}{32}}$



05. (a) Find the least common multiple (L.C.M.) of the following algebraic expression.

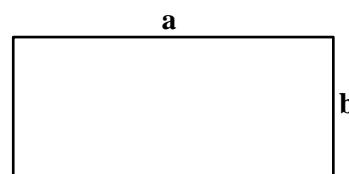
(i)  $24, 8y, 10y^2$

(ii)  $x^2 - a^2, x^2 - 2ax + a^2, x^2 - ax$

(b) Chamal has to take three medicinal pills named A, B and C. The pill A is to be taken once in every  $(6x + 3)$  hours and the pill B is to be taken once in every  $8(2x + 1)^2$  hours. The pill C is to be taken once in every  $3[(2x)^2 - 1]$  hours. If Chamal has taken the three pills together at a certain moment, find the time period that he has to wait to take three pills together again. Give the answer in an algebraic expression.

06. (i)  $(a + 5)(a - 3)$  expand and simplify.

(ii)



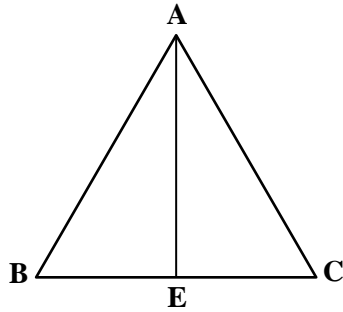
The area of the given rectangle is shown by  $x^2 - 5x + 6$ . If the length and breadth of it are  $a$  and  $b$  respectively, find two binomial expressions suitable for the values of  $a$  and  $b$ .

(iii) Show that the rectangle becomes a square if the breadth of it is increased by one unit.

(iv) Find the least common multiple (L.C.M.) of the expressions  $x^2 - 4$  and  $(x - 2)(x + 3)$

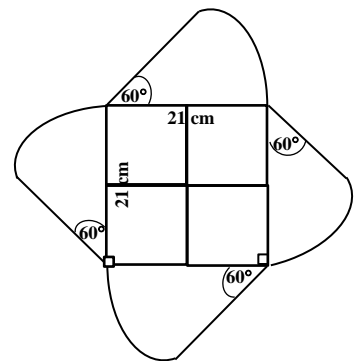
**Part -B**

07. In the triangle ABC the bisector of the angle  $\hat{BAC}$  meets the side BC at E



- (i) Prove that  $\hat{ABE} + \hat{AEB} = \hat{ACE} + \hat{AEC}$
- (ii) Copy this diagram in to your answer script and produce the side BC up to D. Then prove that ,  
 $\hat{ABC} = \hat{ACD} - 2\hat{BAE}$

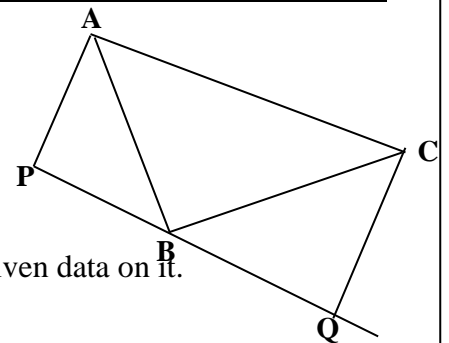
08. Shown in the diagram is a wire frame prepared for a decoration work. It is made up of a square part in which the length of a side is 21cm and four sectors on each side of the square with the central angle  $60^\circ$  are fixed around the square . There are two wire rods perpendicular to each other are fixed in the middle of the square to reinforce the frame.



- (i) Find the perimeter of the whole frame.
- (ii) Find the total length of wire used to make the frame.
- (iii) Small paper flowers are to be fixed on the perimeter of the frame such that the difference between two flowers is 2cm, Show that the number of flowers required for it is less than 90.
- (iv) If the amount of money spent to make the frame is Rs. 2500/= and the cost for preparing and fixing one paper flower is Rs. 15/= find the total cost spent for the whole work.

09. Of the triangle ABC,  $AB = BC$  and  $\hat{ABC} = 90^\circ$  .

AP and CQ perpendiculars are drawn to the line passes through B, from A and C respectively.

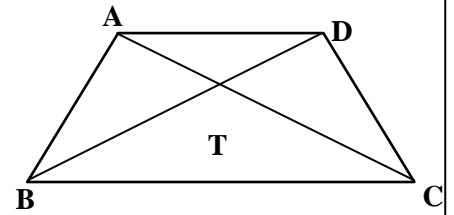


- (i) Copy the above diagram into your answer script and mark the given data on it.
- (ii) Find the value of  $\hat{BCA}$
- (iii) Show that  $\hat{BCQ} = \hat{PBA}$
- (iv) Prove that the triangle ABP and triangle BCQ are congruent.

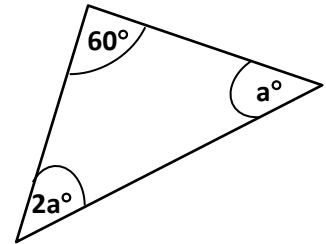
10. AB and AD sides of the quadrilateral ABCD are produced up to P and Q respectively.  
BD is joined, and  $\angle PBC = \angle QDC$ . Denote this information on a diagram and prove that  $BC = DC$ .

11. Diagonals AC and BD of the quadrilateral ABCD are intersecting at T

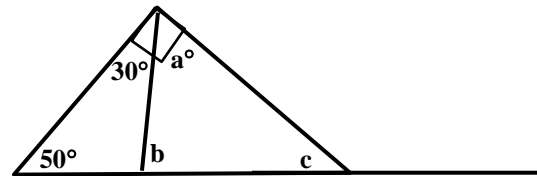
- (i) If  $AB = DC$  and  $AC = BD$  show that  $\triangle ABD \cong \triangle ACD$   
 (ii) Prove that  $\angle D\hat{A}T = \angle A\hat{D}T$   
 (iii) Prove that  $\angle B\hat{A}D = \angle C\hat{D}A$   
 (iv) Prove that  $BT = TC$



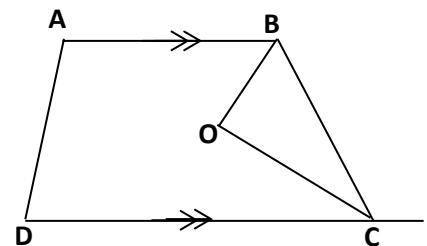
12. (a) (i) Find the value of a.



- (ii) According to the data given on the diagram find the value of a, b and c.



- (b)  $AB \parallel DC$  of the quadrilateral ABCD Bisectors of the angles  $\angle ABC$  and  $\angle BCD$  are met at O, show that  $\angle BOC = 90^\circ$



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