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சபரகமுவ மாகாண கல்வித் திணைக்களம்
Sabaragamuwa Provincial Department of Education

අවසාන වර පරීක්ෂණය - 2018 නොවැම්බර්
இரண்டாம் தவணைப் பரீட்சை 2018
Final Term Test – 2018 November

10 ශ්‍රේණිය
தரம் - 10
Grade - 10

ගණිතය I
கணிதம் I
Mathematics I

පැය දෙකයි
2 மணித்தியாலம்
2 Hours

Part - A

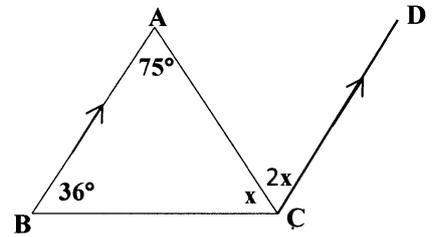
■ Answer all the questions on this paper it self.

01. The area of the square shaped lamina is 30 cm^2 . What is the most suitable value for the length of the side of the lamina from the lengths given below.
(a) 5.4 cm (b) 5.5 cm (c) 5.6 cm

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

02. $\frac{1}{3}$ of fruits in a fruit stall are pineapples. Out of the remaining fruits $\frac{1}{4}$ are apples. What is the fraction of apples out of the total number of fruits.

03. Find the value of the x. Using the information given in the figure.



04. Express in logarithm from $a^x = y$

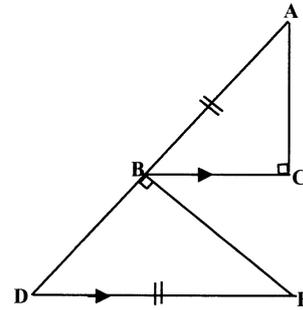
05. The area of the curved surface of a cylindrical vessel in which the radius of the base is 7 cm, is 258 cm^2 . Find the height of it.

06. In a farm of cattle there are foods sufficient for 10 cattles for two days. If six cattles, from that farm, is sent to another farm for haw many days the the foods would be sufficient for remaining cattles.

07. The triangle ABC is congruent to the triangle ADE.

According to the information shown in the diagram .

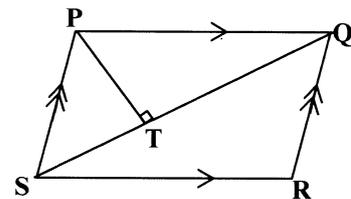
Write the case of congruence and write a side equal to AC.



08. It takes 20 minutes time to fill a tank by a pipe, in which water is flowing in a uniform rate. If two pipes of that type are used. What is the time it takes to fill a half of the tank.

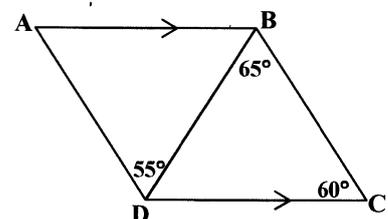
09. Find the least common multiple (L.C.M.) of these terms. $3ab^2$, $2a^2b$

10. In the parallelogram PQRS, the length of the perpendicular drawn from P to SQ is 4 cm. If the area of the parallelogram is 40 cm^2 , find the length of the diagonal SQ



11. $x(2x - 1) = 0$ Solve the equation.

12. According to the information in the figure name an isosceles triangle and write the equal sides of it.

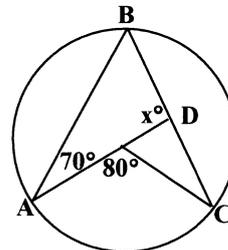


13. Simplify. $\frac{2}{x} + \frac{1}{3x}$

14. The sum of the marks obtained by 10 students for mathematics is 670. The mean value of marks of another 10 students is 71. What is the mean of the marks received by these 20 students.

15. If $(x + a)(x - 3) = x^2 + 2x - b$ write two appropriate values for a and b.

16. The center of the circle is O. According to the information in the figure, find the value of x.

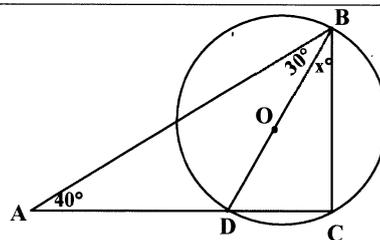


17. If $2x + 7 < 19$ What is the largest whole number suitable for x.

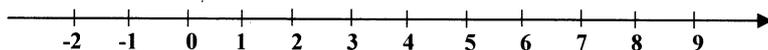
18. A dice in which numbers from 1 – 6 are marked on faces and unbiased coin are thrown on a table at once. What is the probability of having “head” in the coin and an odd number in the dice.

19. The center of the circle is “O”.

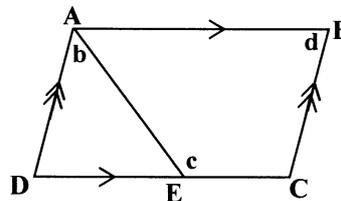
According to the information in the figure. find the value of x.



20. Represent to the all values which satisfy the inequalities $x > 5$ and $x \leq 8$. on the following number line.



21. ABCD is a parallelogram. Some angles of the given figure are shown by b, c and d. Denote the value of d using b and c.

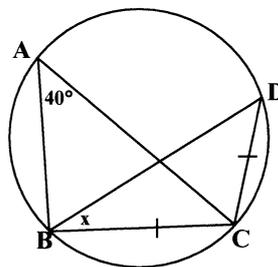


22. $A = \{2, 3, 5, 7\}$. If the expressions given in the table are true mark \checkmark sign and if false mark \times sign.

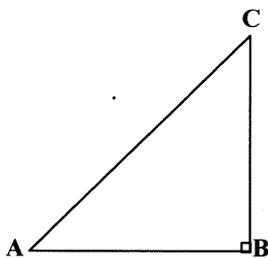
$2 \in A$	
$\{2\} \subset A$	
$n(A) = 16$	

23. Factor. $25x^2 - 9$

24. In the figure $BC = CD$. Find the value of $\angle CBD$.



25. Mark the point T on the side AB which is equidistant to sides AC and BC using your knowledge about loci.



Part - B

■ **Answer all the questions on this paper itself.**

01. a) Nalan got plucked the coconuts of his land. He gave 40 coconuts to the plucker as his charge and brought the remainder home. Later he kept $\frac{1}{8}$ of coconuts for domestic use and sold $\frac{6}{7}$ of remaining coconuts and the rest was distributed among the neighbors.

(i) What is the fraction of the coconuts remaining after keeping for the domestic use?

(ii) What is the fraction of the coconuts sold?

(iii) If the number of coconuts sold is 600.

i. Find the total number of coconut plucked?

ii. Write the number of coconuts given to the plucker as a fraction of the total number plucked.

b) Three men can excavate a 15 m long drain in two days

i. What is the number of man days required to excavate a drain, 120 m in length.

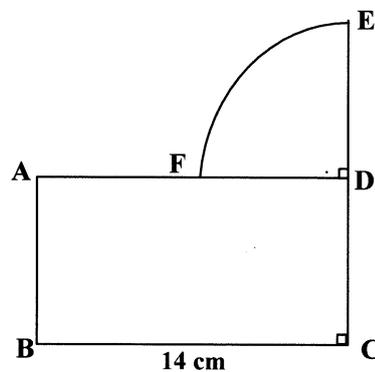
ii. If 4 men are employed to do this work how many days they will take to finish it.

02. Shown in the figure is a design for a badge. The length of the rectangular part of it is twice as the breadth and the radius of the sector is equal to the breadth. Of the rectangle

(i) What is the radius of the sector?

(ii) Find the arc length of the sector.

(iii) Find the perimeter of the badge.



(iv) Find the area of the sector.

(v) Another small rectangular part inside the ABCD rectangle is to be coloured with a different colour. Area of that part is 3.5 cm^2 greater than the area of the sector, and the side AB must be a side of it also. Draw that part by a rough sketch on the given figure and mention the correct measurements on it.

03. Information about the charging of income tax at present is shown in the following table.

Income	Tax rate
First Rs. 500 000.00	tax free
Next Rs. 500 000.00	4%
Next Rs. 500 000.00	8%

◆ Annual income of Ranjith is Rs. 1 200 000.00

(i) What is the taxable income of Ranjith?

(ii) Find the amount of the tax he has to pay for the second Rs. 500 000.00 of his income.

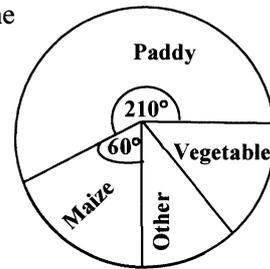
(iii) Find the total tax payment his has to pay as income tax.

(iv) The annual value of Ranjith's house is assessed as Rs. 24 000. The Pradeshiya Saba of the area charges Rs. 480 for a quarter as rates for the house.

(a) What is the annual rates charged for this house

(b) Find the percentage of rates charged by that Pradeshiya Saba.

04. (a) The pie chart given here is showing..... the information about the crops cultivated by 60 farmers in Gamunupura farmers village.

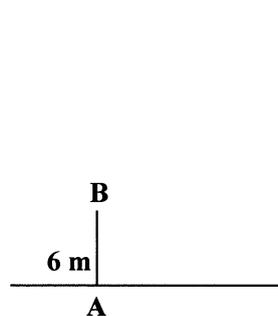


(i) Find the number of farmers who has cultivated paddy?

(ii) If the number of farmers who cultivated other crops is 6, what is the angle of the sector of the pie chart for that sector

(b) A person who is at a window of the 2nd floor of a building (AB) sees a vertical tower in the horizontal ground outside. The angle of elevation at the top of the tower is 40° and the angle of depression of the foot of the tower is 55°. The height from ground level to the window is 6 m.

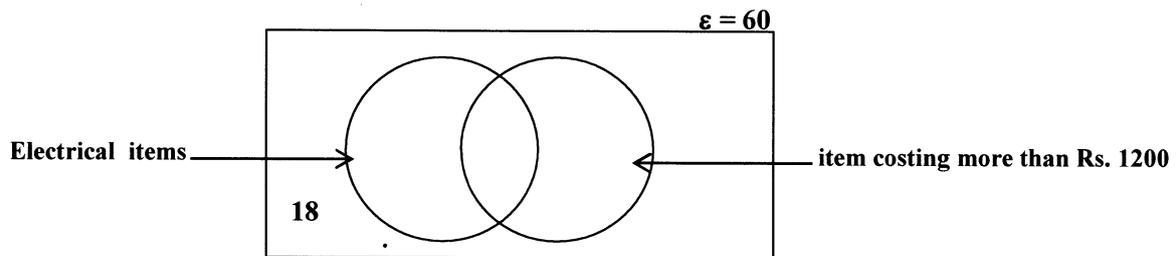
(i) Mark this information in the figure given below.



(ii) Rajan who draws a scale diagram to depict this information has taken 12 cm to represent the height from the ground level to the window. Denote the scale he has taken to draw the diagram as a ratio.

(iii) In the scale drawing drawn, the height of the tower is 16 cm. What is the actual height of the tower.

05. Out of the 60 selling items of the “Aruna Trade Center” 22 are electrical items and 30 items are costing more than Rs. 1200 Given below is an uncompleted Venn diagram to depict this information.



- (i) Shade the region that represents the items which are not electrical and the cost is not more than Rs. 1200
- (ii) Complete the Venn diagram by filling each region with the relevant number of elements of it.
- (iii) How many electrical items are there which are costing more than Rs. 1 200
- (iv) Because of a new tax levied the number of electrical items costing more than Rs. 1 200 is doubled. Then what is the maximum income that the trader can earn by selling that items.

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තෙවන වාර පරීක්ෂණය - 2018 නොවැම්බර්
இரண்டாம் தவணைப் பரீட்சை 2018
Third Term Test – 2018 November

10 ශ්‍රේණිය
தரம் - 10
Grade - 10

ශ්‍රේණිය II
கணிதம் II
Mathematics II

පැය තුනයි
3 மணித்தியாலம்
3 Hours

- Select 5 questions from part A and 5 question from part B and answer 10 questions only
- Volume of a cylinder with the base radius r and height h is $\pi r^2 h$

A – කොටස

01. An incomplete table prepared to draw the graph of the function $y = 5 - x^2$ is shown below.

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

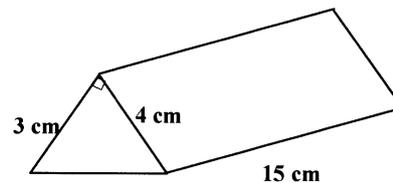
- Find the value of y when $x = 0$
- Using the scale of 10 small division as one unit along both the x – axis and the y – axis draw the graph of the above function on a graph paper.
- Write the range of x in which the function is positive and increasing.
- Find the roots of the equation $x^2 - 5 = 0$ using the graph.
- Write the equation of the function when the drawn graph is moved one unit downward along the axis of symmetry and write the coordinates of the points that the new graph intersects the x – axis.

02. A frequency distribution containing the data about the number of kilograms of rice sold in a trade senter during 30 days is given below. The price of 1 kg of rice is Rs. 70.

Amount of rice (kg)	1 – 25	26 – 50	51 – 75	76 – 100	101 – 125	126 - 150
Number of days	3	6	10	6	3	2

- Calculate the mean number of rice kilograms sold in one day, using a suitable assumed mean or any other method. Hence find the mean income received by selling rice in one day.
- By assuming that there are 50 kgs of rice in one bag and using the mean you found calculates the number of rice bags required to sell in the trade center in next 20 days.

03. (a) Shown in the figure is a solid right metal prism with a right angled triangular cross section. This prism is melted and 24 cm^3 of metal is separated in melting. Using the remaining volume of metal, a cylindrical rod is made. If the length of it is $h \text{ cm}$ and the radius is $r \text{ cm}$ show that



$$r = \sqrt{\frac{21}{h}}$$

- (b) The volume of metal separated is added to 125 cm^3 of more metal and using the total volume, cuboid shaped metal rods with the length 8 cm and the area of the cross section 5 are made. If the number of rods made is x , write down an inequality with x and by solving it find the maximum number of rods can be made.

04. (a) A, B and C are three towns. Kasun by his motor car travels to town B from town A with a uniform speed of 44 kmh^{-1} . The distance from town A to town B is 66 km .

- (i) Find the time it takes to travel from town A to town B.

From town B he travels again to C with a uniform speed of 60 kmh^{-1} and the time he takes to travel from B to C is $2 \frac{1}{2}$ hours.

- (ii) Find the distance between the towns B and C.

- (iii) Find the average speed of Kasun for the whole journey from A to C through B.

- (b) Find the value of $\frac{728.5}{4.76 \times 13.08}$ using logarithm tables.

05. (a) In a grade 10 class of a mixed school the number of girls is 10 less than the twice of the number of boys. The number of girls is 5 more than the number of boys. Take the number of girls as x and the number of boys as y .

- (i) Construct two simultaneous equations using the above information.

- (ii) By solving it find the number of boys and the number of girls separately.

- (b) The length of a rectangle is 4 cm greater than the breadth of it. If the breadth of the rectangle is x .

- (i) Write an expression for the length.

- (ii) If the area of the rectangle is 45 cm^2 . Show that the equation $x^2 + 4x - 45 = 0$ can be obtained by it.

- (iii) Find the breadth of the rectangle by solving the above equation.

06. (a) (i) Factor. $x^2 - 5x - 14$

- (ii) Using the above factors show that the factors of the expression

$$(x + 9)^2 - 5(x + 9) - 14 \text{ is } (x + 2)(x + 11)$$

- (iii) Find the L.C.M. (Least common multiple) of $(x + 2)^2$, $x^2 - 5x - 14$ and $(x + 9)^2 - 5(x + 9) - 14$

- (b) If $x + y = \sqrt{24}$ and $x^2 + y^2 = 15$ find the value of xy .

Part - B

■ **Answer only 5 questions.**

07. Jagath who is doing a computer game by winning the 2nd stages of it has obtained 55 marks Now he is entering the 3rd stage. If he wins the 3rd stage, will receive 70 marks. Like this in every stage the number of marks receiving is increased by 15 marks than the previous stage. If 1000 marks are offered in the final stage of the game, show that the total number of marks he can obtain will not exceed 34 000

08. Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions. Show construction lines clearly.

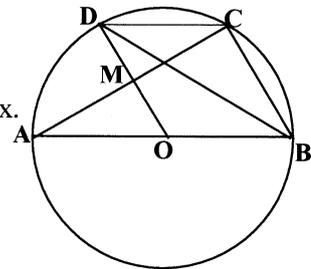
- (i) Construct the triangle ABC such that $AB = 7$ cm, $\hat{A} = 120$ and $BC = 6$ cm
- (ii) Construct the perpendicular from C to the produced AB.
- (iii) Construct a line parallel to AD and passes through C.
- (iv) Complete the quadrilateral ADCE such that $DA = CE$
- (v) Name a line equal to AC and state the reason for your answer.

09. AB is a diameter of the circle in which the center is "O". Points D and C are on the circle. DO and AC lines intersect at M.

- (i) Name a right angle and give the reason for the answer.

If $\hat{A}CD = x$, by giving reasons find the values of following angles using x.

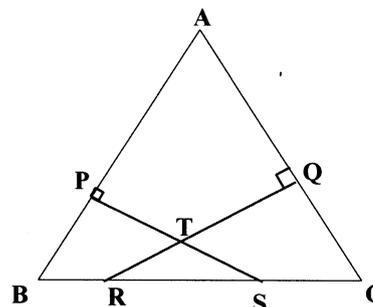
- (ii) $\hat{A}OD$
- (iii) $\hat{A}BD$
- (iv) If BD bisects the angle $\hat{O}BC$ prove that, $DO \parallel CB$
- (v) Prove that $AM = MC$



10. ABCD is a parallelogram mid points of the sides AB and CD are C and Y respectively. Diagonal BD intersects the lines AY and CX at P and Q respectively. Prove that AQCP is a parallelogram.

11. ABC is a triangle and $AB = AC$. Points R and S are situated on BC such that $BR = SC$. Perpendiculars drawn from S and R to the lines AB and AC are SP and RQ and they are intersecting at T.

- (i) Prove that $BS = RC$
- (ii) Prove that $\triangle PBS \cong \triangle RCQ$
- (iii) Prove that $TR = TS$
- (iv) Prove that $\hat{RTS} = 2\hat{A}$



12. (a) (i) In the box "A" there are 3 red plastic plates and 2 blue plastic plates. In the box B there are 2 red plastic cups and 2 yellow plastic sups. All plates are with the same size and same shape and all the cups are with the same size and same shape. Piyal takes out a plate out of the box A and a cup out of the box B randomly. Represent the sample space of all possible outcomes of this event by a grid.

(ii) Find the probability of taking at least one vessel (cup or a plate) in red colour.

(b) (i) Draw a tree diagram to represent the event that the plate taken out being red or not.

(ii) Extend your tree diagram to show the event that the cup taken out being red or not.

(iii) Find the probability of the event that taking at least one vessel (a cup or a plate) being not red in colour.
